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2018 AIR MONITORING NETWORK PLAN
Final



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ACKNOWLEDGEMENTS

In 2018, the Maricopa County Air Quality Department's Air Monitoring Division maintained 25 ambient air monitoring sites throughout Maricopa County. The division has nineteen team members including: one manager, one quality assurance officer, two technician supervisors, one air quality specialist, one data analyst, one database assistant, and twelve technicians.

The division would especially like to thank all of its personnel and the department's atmospheric scientist for their excellent job in helping to maintain Maricopa County's air monitoring program. They are: Ben Davis, Gary Ensminger, Robert Dyer, Reynaldo Santillano, John Neff, Ceresa Stewart, Nikki Peterson, Hirna Patel, Tom Shorb, Chris Hernandez, Miguel Reyes, Steve Sample, Robert Sawicki, Alex Herrera, Daniel Daniels, Freddie Alejandro, Tom Dubishar, David Dubiel, Jose Bravo, Andy Clifton, and Ron Pope, respectfully.

In addition, the department gratefully acknowledges the assistance of other agencies, which provided data and helpful comments to this review. These may include the Arizona Department of Environmental Quality, Pinal County Air Quality Control District, the Maricopa Association of Governments, and the Tribal air monitoring organizations adjacent to Maricopa County.

Last, we would like to thank the United States Environmental Protection Agency's Region 9 personnel for their guidance and support regarding our air monitoring program. The department respectfully submits this 2018 Air Monitoring Network Plan to Region 9 for review.

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ABSTRACT

In 2018, the Maricopa County Air Quality Department (MCAQD) Air Monitoring Division (AMD) successfully operated a robust air quality surveillance system that monitored for regulated ambient air pollutants as per *40 CFR Parts 50 and 58*. This 2018 Air Monitoring Network Plan (AMNP) documents how the system performed during 2018. The air monitoring data produced are intended for regulatory compliance determinations regarding six regulated ambient air pollutants, known as the "criteria pollutants". Except where otherwise noted, each monitor meets the requirements of *40 CFR Part 58 – Subpart G - Appendices A, B, C, D, and E,* where applicable.

The plan covers changes made to the air monitoring network in 2018, and it provides supporting information for those changes. In 2018, there were no request waivers from air monitoring regulations. The MCAQD informs personnel at the Environmental Protection Agency's Region 9 (EPA R9) office of any significant data collection interruptions immediately.

During 2018, some notable accomplishments were:

- working with the City of Phoenix on a significant upgrade to the property that houses the North Phoenix site;
- performing specialized particulate air monitoring for chemical speciation during the 2018 – 2019 holiday season;
- participating in low-cost small air sensors studies with EPA; and,
- one AMD employee, Robert Dyer, QC Supervisor, received a director's award for Supervisor of the Year.

Department personnel maintained successful working relationships with regulatory agency representatives, customers, and stakeholders. We provided our data to persons from these groups as requested, and we responded to calls from the public regarding air monitoring questions. We maintained our air monitoring website for the public's benefit as well as data reporting to AIRNow.

INTRODUCTION TO THE AIR MONITORING NETWORK PLAN

Each year, MCAQD produces a comprehensive AMNP that provides vital information regarding the air monitoring surveillance system operating within Maricopa County. The plan addresses the United States Environmental Protection Agency's (U.S. EPA) requirements for operating the surveillance system as per *40 CFR Part 58 - Ambient Air Quality Surveillance.* As per *40 CFR Part 58, Subpart B §58.10(a)(1),* the EPA requires each air monitoring organization (MO) operating within the U.S. and its territories to develop and submit an annual plan by July 1st following a 30-day public comment period.

The plan is complementary to the annual data certification process. It helps us continuously review, assess, and improve how well the County's air monitoring surveillance system, or "network", is performing. The design and performance of an ambient air monitoring network and data certification process are covered by the regulatory requirements found in *40 CFR Part 58 - Subpart A (general provisions), Subpart B (monitoring network), Subpart C (special purpose monitors (SPM)), Subpart D (comparability of ambient data to the NAAQS), Subpart F (air quality index (AQI) reporting), and Subpart G (federal monitoring).*

The plan addresses other regulatory requirements found in *40 CFR Part 58, Subpart G - Appendix A (quality assurance requirements for state and local air monitoring stations (SLAMS), Appendix C (ambient air quality monitoring methodology), Appendix D (network design criteria for ambient air quality monitoring), and Appendix E (AQI and daily reporting).* The plan's information includes, but is not limited to:

- Metadata and detailed descriptions of the air monitoring sites;
- The purpose for monitoring and the type of monitoring conducted at each site;
- Data regarding each monitor's siting and operation;
- Three years of criteria pollutant (CP) data from each monitor;
- Design values metrics that identify the monitoring site with the highest CP concentration measured over 3 years and the minimum quantity of monitors required for each CP network;
- Summaries of pollutant data by network and required statistical analyses;
- The quality and suitability of pollutant data for comparison to the NAAQS;
- The NAAQS compliance status of MCAQD monitors for the six CPs, including exceedances and violations;
- Proposed changes to sites, monitors, or analytical methods within the next 18 months;
- Brief information regarding special purpose and/or research-driven air monitors, if operated;
- Any requests for waivers from specific air monitoring requirements;
- The reporting of up-to-the-hour real-time pollutant data to the public via our website and AIRNow; and
- Public comments received regarding the final draft AMNP and MCAQD's response to the comments.

Regarding public comments, each year the MCAQD solicits comments from the public on the final draft AMNP during a 30-day public comment period. We also hold an open forum meeting, which is open to the public. As needed, the MCAQD amends the final draft based on the comments received and submits the Final AMNP to EPA R9 for review and approval. The EPA R9 completes the review process within 120 days of receiving the plan, and the EPA R9 Administrator, or their representative, must approve the requests for network changes and waivers. If EPA does not approve the plan, then

the MCAQD addresses the concerns presented by EPA R9 personnel and submits a revised plan. Following EPA's approval of the plan, MCAQD posts it on our website and the EPA makes it available through the Ambient Monitoring Technology Information Center (AMTIC) webpage for State and Local Monitoring Plans.

In 2018, the MCAQD's monitoring network was comprised of 24 monitoring sites. Figure 1 shows the location of MCAQD's air monitoring sites discussed in this year's plan.

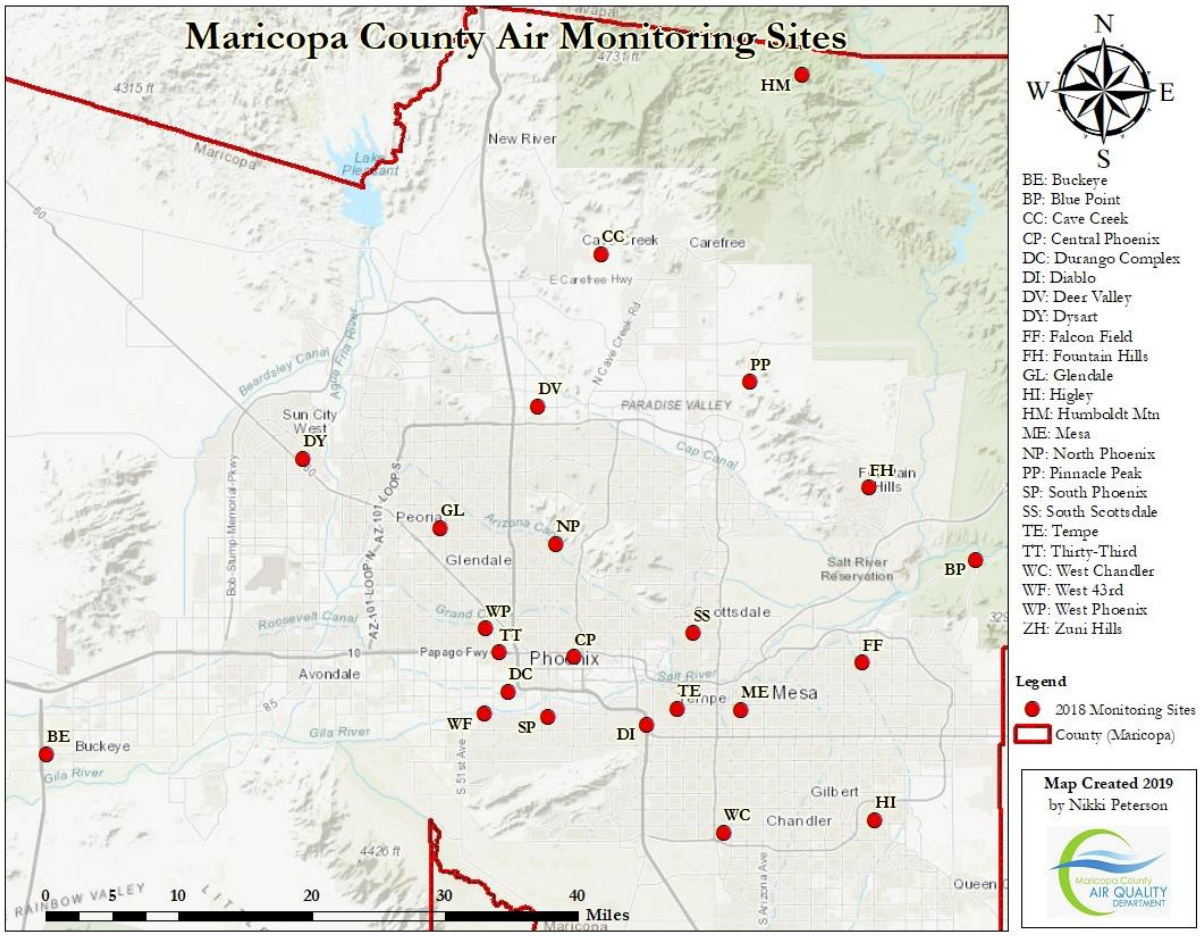


Figure 1. 2018 Air Monitoring Site Map

Overview of the Clean Air Act and Criteria Pollutants

Between the years 1900 and 1970, the emission of the six CPs increased significantly. These pollutants occur throughout the U.S., and are known to cause health problems, property damage, and harm to the environment. The first federal legislation involving air pollution control was the Air Pollution Control Act of 1955, which provided funds for federal air pollution research. Later, the Clean Air Act (CAA) of 1963 was passed, which was the first federal legislation for actually controlling air pollution. It authorized research into techniques for air monitoring and controlling air pollution. This led to the Air Quality Act of 1967 being passed, which expanded federal studies of air pollutant emission inventories, ambient air monitoring techniques, pollution control techniques, and initiated review of air pollution transport.

The enactment of the 1970 CAA produced a major shift in the federal government's role in air pollution. It authorized the development of comprehensive federal and state regulations to limit pollutant emissions from stationary and mobile sources. It also set forth four major regulatory programs affecting stationary pollution sources:

- NAAQS,
- State Implementation Plans (SIP),
- New Source Performance Standards (NSPS), and
- National Emission Standards for Hazardous Air Pollutants (NESHAPs).

The 1977 CAA Amendments (CAAA) furthered air monitoring efforts related to the "Prevention of Significant Deterioration" (PSD). In short, PSD air monitoring data are used for permitting a new source wishing to start-up in an attainment area. Then, the 1990 CAAA increased the authority and responsibility of the federal government, and it established new regulatory programs for acid rain deposition, stationary source permitting, and expanding the NESHAPs program to control toxic air pollutants. It also included provisions for protecting stratospheric O_3 and expanding air quality research programs.

The CAA, and its amendments, provide the framework for pertinent State/Local/Tribal (S/L/T) agencies to assess and protect air quality through an air monitoring program. Unless generated for research, special studies, or unless otherwise noted, each monitor meets the requirements of *40 CFR Part 58 – Subpart G - Appendices A, B, C, D, and E,* where applicable. This means that the data MCAQD produces are of acceptable quality for NAAQS comparisons and compliance determinations, which is the primary purpose for generating the data. Please note that *Appendix B* applies to PSD monitoring only and that no PSD monitoring was conducted within Maricopa County.

The MCAQD monitors for all six CPs, which are:

1. Carbon monoxide (CO)
2. Lead (Pb)
3. Nitrogen oxides (NO_x) with nitrogen dioxide (NO_2) used as the indicator compound
4. Ozone (O_3)
5. Particulate matter ≤10 micrometers (PM_{10}) and ≤2.5 micrometers ($PM_{2.5}$)
6. Sulfur dioxide (SO_2)

The U.S. EPA regulates CPs using the NAAQS, which establish ambient levels for each CP using health and welfare-based criteria. There are two sets of NAAQS standards. As per the *CAA §109(b)*, the "primary" NAAQS are designed to provide an adequate margin of safety that is requisite to protecting public health. The "secondary" NAAQS are designed to protect public welfare from any known or anticipated adverse effects associated with the presence of a CP in the ambient air. The primary standards protect public health and secondary standards protect public welfare by preventing damage to property such as farm crops and buildings, visibility impairment in national parks and wilderness areas, and the protection of ecosystems.

The NAAQS are not static. The CAA requires that they undergo periodic review using the most recent medical, epidemiological, physiological, and ecosystem research available. Historically, when a NAAQS level changes; the new level(s) is lower. Lowering a NAAQS level occurs when medical, epidemiological and other scientific research such as ecosystem and visibility effects demonstrate that the NAAQS are not adequately protect public health and welfare. Detailed information regarding the NAAQS development can be found in this section under each pollutant's overview.

The NAAQS review is a lengthy process that assesses the science upon which each NAAQS is based as well as the standard itself. The Clean Air Scientific Advisory Committee (CASAC) provides independent advice to the U.S. EPA concerning the need to change a standard. In addition, comments are solicited from the public. More information regarding the NAAQS review process is available at EPA's website.

The U.S. EPA's Regional Offices oversee the enforcement of the CAA, and MCAQD falls under the jurisdiction of EPA R9. The U.S. EPA Office of Air Quality Planning and Standards (OAQPS) oversees the air monitoring program at a national level, leads regulatory and/or policy changes affecting air monitoring operations and quality requirements, and engages in the review of the NAAQS.

The National Ambient Air Quality Standards

The NAAQS are geared toward improving air quality in geographical areas where the current quality is unacceptable as well as preventing air quality deterioration in geographical areas where the air is relatively free of pollution. Since each CP has different health effects and environmental damage potential, the NAAQS level(s) are different for each pollutant. Some pollutants have standards for both long-term and short-term averaging times. The short-term standards are designed to protect against acute health effects, while the long-term standards are designed to protect against chronic health effects. Table 1 shows a summary of the current primary and secondary NAAQS levels for each CP.

Table 1. National Ambient Air Quality Standards

Pollutant		Standard Type	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Matter (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: Adapted from the table shown: https://www.epa.gov/criteria-air-pollutants/naaqs-table

The Air Quality Index

To better communicate current CP health risks to the public, EPA developed the Air Quality Index (AQI), a health risk communication tool that converts CP concentrations into six health-impact related color-coded indices based upon the NAAQS. The AQI communicates the air quality forecast using the graduated color scheme shown on Figure 2. The AQI is used to provide an overall AQI value by combining PM and O_3 concentrations as well as an AQI value for each CP.

Developing AQIs was furthered over the past few years by continuous analyzers replacing many of their sampler predecessors; thereby making data available electronically as it is generated. Currently, many MOs, including MCAQD, provide near real-time CP data to their agency's website and/or the EPA's AIRNow website.

Continuous air monitoring data helps air quality professionals gauge current, local air quality conditions. Air quality forecasters can better project AQI values for the next 24 to 48 hours so the public can better prepare for expected air quality conditions. For instance, members of the public may use the AQI values to reduce their exposure to air pollution and its associated health effects by modifying their daily activities.

Index	Color Designation	Air Quality	Health Impact
0 – 50	Green	Good	No harmful effects expected.
51 – 100	Yellow	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101 – 150	Orange	Unhealthy for Sensitive Groups	Active children & adults, people with respiratory disease, e.g., asthma, should limit prolonged outdoor exertion.
151 – 200	Red	Unhealthy	Everyone should observe caution. Avoid prolonged outdoor exertion.
201 – 300	Purple	Very Unhealthy	Avoid all outdoor exertion. Use extreme caution outdoors.
301 – 500	Maroon	Hazardous	Everyone should avoid all outdoor exertion.

Figure 2. The Air Quality Index

Source: *40 CFR Part 58, Appendix G – Uniform Air Quality Index (AQI) and Daily Reporting*

The AQI is used throughout the U.S. and the EPA AIRNow website provides air pollution forecast maps for combined O_3 and PM, plus AQI values for CO, O_3, PM_{10}, and $PM_{2.5}$ data for major metropolitan areas, including the Phoenix metropolitan area. Again, different colors on the map indicate health risks using pollutant concentrations.

Figure 3 shows an overall moderate health risk due to the combination O_3, PM_{10}, and $PM_{2.5}$ within the yellow area and an increased risk for unhealthy or sensitive groups within the orange area.

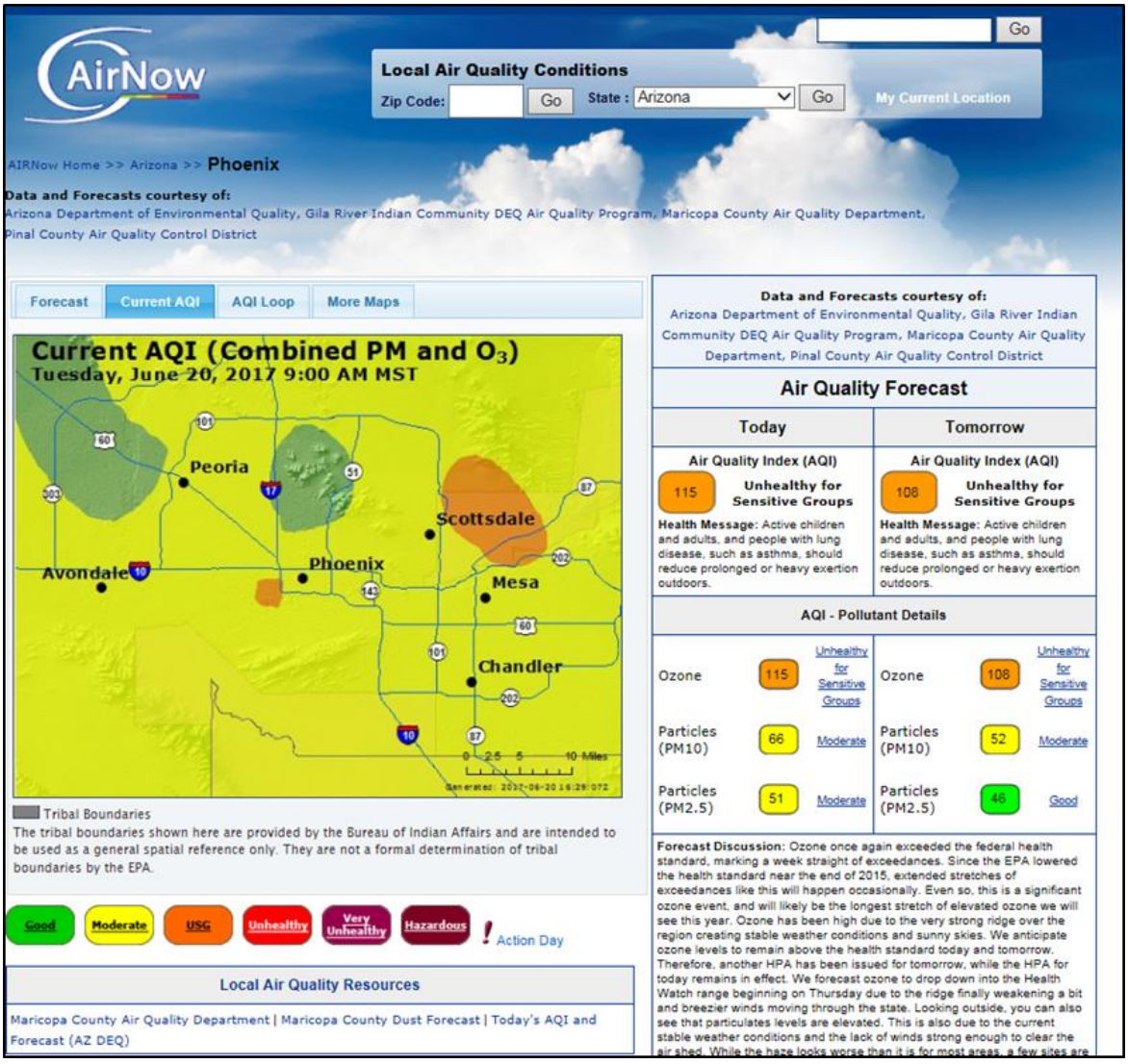


Figure 3. AIRNow AQI Forecast Map

Source: EPA AIRNow Website

The MCAQD has participated in the AIRNow AQI program since 2001. The MCAQD, in cooperation with ADEQ and the Pinal County Air Quality Control District (PCAQCD), expanded the geographical area covered by the AIRNow maps. This area now includes sites as far east as Queen Creek, as far south as Casa Grande, and as far west as the town of Palo Verde.

Figure 4 shows the MCAQD AQI webpage.

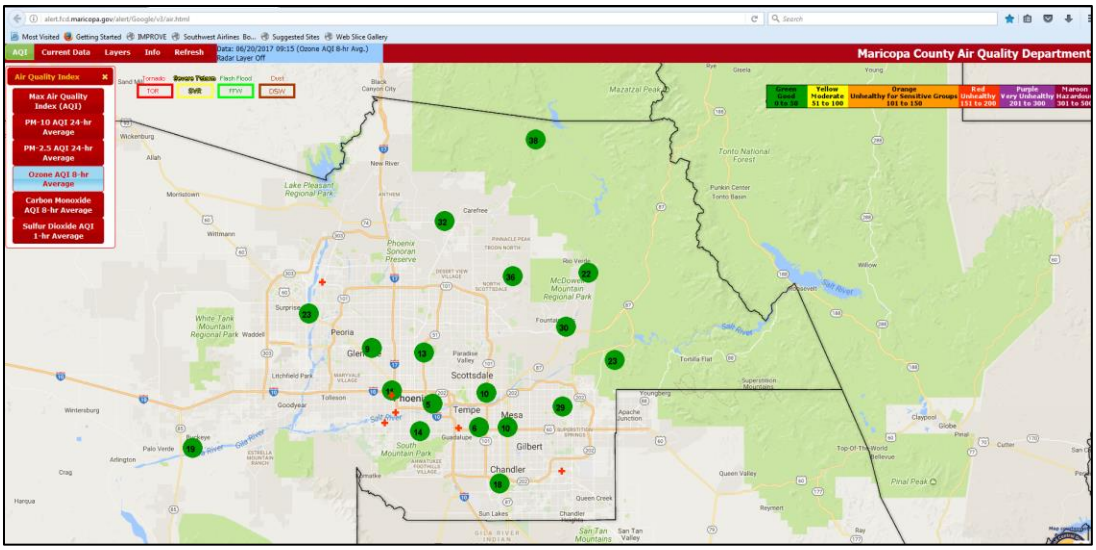


Figure 4. MCAQD AQI Map

Source: MCAQD's Air Quality Website

In addition to AQI values, the MCAQD website also provides hourly pollutant concentrations for CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, and SO_2. Figure 5 shows the hourly O_3 data webpage. Please note that if a site does not have an O_3 monitor, a red cross "+" shows to indicate that an O_3 monitor is not at that site or has not reported in in several hours. The hourly data webpages used the same depiction on a site-by-site basis for other pollutant monitors.

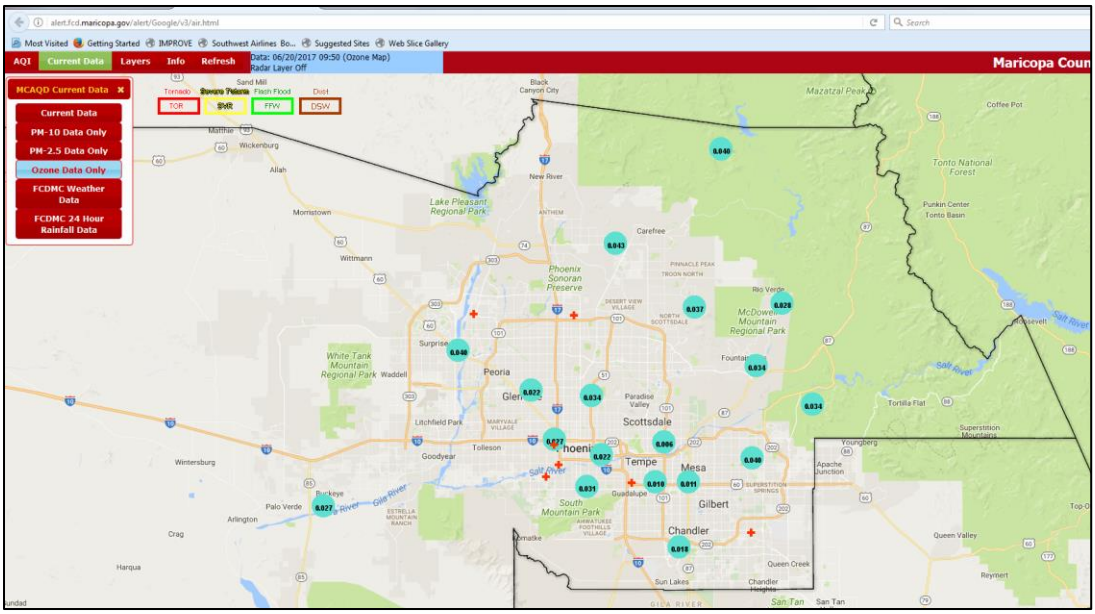


Figure 5. MCAQD Hourly Pollutant Data Map

Source: MCAQD's Air Quality Website

Information Regarding the Causes, Characteristics, and Compliance of Criteria Pollutants

Unless otherwise noted, the information regarding air pollutants in this section was compiled from various pages at the EPA's Air and Radiation website.

Carbon Monoxide (CO)

Carbon monoxide is a colorless, odorless gas found in both outdoor and indoor air. Carbon monoxide is primarily formed by the incomplete combustion of fossil fuels, e.g., carbon-containing fuels, and the photochemical reactions of gases in the atmosphere. Concentrations of CO tend to peak in the colder, winter months. Carbon monoxide is produced by both natural and anthropogenic sources, aka, human activities. One of the more significant anthropogenic sources of CO is automobile exhaust. Concentrations of CO from motorized vehicles lowered considerably over the last two decades partly due to replacing carburetors with fuel injectors, which results in a more complete combustion of fuel. Natural, or biogenic, sources of CO emissions include volcanic emissions and smoke from wildfires. Smoke from tobacco, cooking, fireplaces, and woodstoves contribute to indoor exposure to CO. In Arizona, the primary sources of CO are exhaust from motor vehicles, electricity generation, industrial and commercial boilers, and household natural gas burning. Carbon monoxide can be a minor contributor to the formation of ground-level O_3.

Carbon monoxide enters the body through inhalation, and the body eliminates CO primarily through exhalation and to a lesser extent through metabolic activity. After being inhaled, CO enters the bloodstream and binds to the blood's hemoglobin; thereby forming carboxy-hemoglobin that displaces oxygen (O_2) in the blood. This reduces the blood's capacity to carry O_2 to organs and tissues and causes the body to become O_2 deprived. This deprivation of O_2 is called hypoxia. This can adversely affect those with anemia, because anemia already reduces the blood's ability to carry O_2. Exposure to CO can result in a type of cardiovascular disease called ischemic heart disease, especially for those with existing heart problems. The central nervous system is adversely affected by CO as well. Acute exposure to severely high levels of CO is toxic and potentially fatal, and its effects on the body are well-known and widely studied. According to the Agency for Toxic Substances and Disease Registry, severe acute poisoning can cause cardiac arrest, heart attack, seizers, hypotension, respiratory arrest, noncardiogenic pulmonary edema, and coma. Moderate exposure may include many symptoms, such as confusion, chest pain, and weakness. Mild exposure may lead to symptoms that include headache, nausea, vomiting, dizziness, and blurred vision.

In 1971 EPA established identical primary and secondary standards for CO: an 8-hour primary standard at 9 parts per million (ppm) and 1-hour primary standard at 35 ppm. The EPA has reviewed the CO NAAQS several times since 1971, which led to the secondary standard being revoked in 1985. The primary standard levels have not changed to date, and currently, CO concentrations nationwide are substantially lower than the CO NAAQS. No exceedances or violations of the CO NAAQS occurred at any site in 2018. In 2018, Maricopa County achieved its 23nd consecutive year of compliance with the 8-hour CO standard.

This general information was supplemented by the EPA OAQPS Health and Environmental Impacts Division's publication the *Quantitative Risk and Exposure Assessment for Carbon Monoxide – Amended July 2010*, which was produced for the 2010 CO NAAQS review.

Lead (Pb)

Lead is a heavy metal that occurs naturally in the environment and it is used in manufactured products. The major sources of Pb emissions have historically been motor vehicles and industrial sources. In the early 1970s, EPA established national regulations to reduce the Pb content in gasoline, gradually. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in "highway motor vehicles" in December 1995. A highway vehicle includes, but is not necessarily limited to passenger vehicles propelled by their own motor, whether such motor is powered by gasoline, diesel fuel, special motor fuels, electricity, or otherwise.

As a result of EPA's regulatory efforts to remove Pb from gasoline, levels of Pb into the air decreased by 94 percent between 1980 and 1999. Levels of airborne Pb in Maricopa County were drastically reduced starting with the introduction of unleaded gasoline. Since Pb concentrations were consistently well below the NAAQS, Maricopa County was allowed to discontinue monitoring for airborne Pb in 1997; although monitoring has resumed today, see below.

Due to the phase-out of leaded gasoline, metals processing is the major source of lead emissions to the air today. The highest levels of Pb in air are generally found near lead smelters. General aviation airports are also a significant source of Pb, as general aviation fuel still contains Pb additives. Other stationary sources include waste incinerators, utilities, and Pb-acid battery manufacturers.

Exposure to Pb has an array of adverse health effects. Once taken into the body, Pb distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the O_2 carrying capacity of the blood. Currently, the foremost health effects associated with Pb exposure to children are neurological and for adults cardiovascular, e.g., high blood pressure and heart disease. Infants and young children are especially sensitive to even low levels of Pb, which may contribute to behavioral problems, learning deficits, and lowered IQ.

Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, direct discharge of waste streams to water bodies, mining, and erosion. Ecosystems near Pb point-sources demonstrate a wide range of adverse effects including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

In 2008, the Pb primary standard was revised to better protect public health, especially for "sensitive" populations, which include asthmatics, children, and the elderly. Initially, Pb monitoring was required near sources that emitted more than one ton of Pb per year. With the introduction of the revised NAAQS, Pb monitoring was initially required at NCore stations around the U.S. and near other potential sources of Pb. ADEQ operates the local NCore station, the JLG Supersite. In July 2010, MCAQD opened a new Pb monitoring site at Deer Valley Airport, one of the busiest general aviation airports in Maricopa County and the largest expected source of Pb emissions. The Pb NAAQS was reviewed in 2016 and retained without change.

In 2018, no exceedances or violations of the Pb NAAQS occurred at the site. Results from more than eight years of monitoring have shown that ambient levels of Pb at Deer Valley Airport are still well below the current Pb NAAQS.

Nitrogen Oxides (NO_X) with Nitrogen Dioxide (NO_2) as the Indicator Compound

Nitrogen dioxide belongs to a family of reactive gases called NO_x. These gases are formed when fuel is burned at high temperatures, and they are primarily emitted from motor vehicle exhaust and power plants. Nitrogen oxides are key compounds in the production of ground-level ozone (O_3).

Nitrogen dioxide has been selected by EPA as the "indicator" compound for NO_x. Unlike the other gaseous CPs, we measure the ambient levels of NO_x indirectly. The analytical process involves determining the concentration of NO_2, then nitric oxide (NO). The NO_2 and NO concentrations are summed to determine the NO_X concentration.

For most of the population, the primary route of NO_2 entry into the body is inhalation. Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Studies show a connection between breathing elevated short-term NO_x concentrations and increased visits to emergency rooms and hospital admissions for respiratory issues, especially asthma. Additionally, NO_2 reacts with ammonia, moisture, and other compounds to form small nitrate particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis. They can aggravate existing heart disease, leading to increased hospital admissions and premature death, too.

In 1971, EPA established the first primary and secondary standards for NO_2 at 53 ppb, averaged annually. EPA reviewed the standards in 1985 and 1996, and chose not to revise either standard. In January 2010, EPA retained the 1971 standards and added a 1-hour average limit of 100 ppb to the primary standard, determined as a three-year average of the annual 98th percentile value.

Research indicates that individuals who spend time on or near major roadways can experience acute exposures to NO_2 concentrations that are considerably higher than those measured by the NO_2 network. "Near-roadway" means within about 50 meters of a major roadway. Here, the NO_2 concentrations have been found to be approximately 30 to 100% higher than ambient concentrations away from roadways. Research by the EPA shows that NO_2 concentrations inside vehicles can be 2-3 times higher than those measured at nearby area-wide monitors.

For this reason, in February 2010 the EPA revised the 1-hour NO_2 NAAQS and promulgated requirements for monitoring NO_2 near roadways in large urban areas. In response, AMD established two NO_2 monitor sites: Diablo, which is located near I-10 and U.S. Hwy 60 - east of downtown Phoenix, and Thirty-Third, which is located off I-10 and 33rd Avenue - west of downtown Phoenix.

In 2018, there were no exceedances of the 1-hour or annual NO_2 NAAQS. Maricopa County is currently in attainment for the NO_2 1971 and 2010 NAAQS. In fact, no area within the U.S. is in nonattainment with the NO_2 NAAQS.

Ozone (O_3)

Ozone is a colorless, slightly odorous, reactive gas containing three oxygen atoms. Ozone occurs naturally in the Earth's upper atmosphere, or the stratosphere, where it has a beneficial effect of protecting us from the Sun's harmful ultraviolet rays. However, at ground-level, it is the main component of smog, can harm our health, and adversely affect vegetation and ecosystems.

Ozone is not directly emitted into the air, but is formed by a complex photochemical reaction that involves sunlight, heat, and a "soup" of pollutants, especially volatile organic compounds (VOC) and NO_x. Ozone is continually going through a rapid, natural cycle of being formed, then converted back to the more stable, or "normal", "diatomic" oxygen molecule (O_2). Anthropogenic activities have been a leading cause of ground-level O_3 due to VOC and NO_x emissions from industrial facilities, electric utilities, motor vehicles, and chemical solvent vapors. Ozone is likely to reach unhealthy levels on hot, sunny days in urban environments, but it can affect rural areas by being transported long distances by wind. Although the Phoenix metropolitan area has sunshine most of the year, there is a seasonal pattern to O_3 concentrations with lower concentrations occurring in the winter months.

Ozone causes significant physiological and pathological changes in both animals and humans at concentrations present in many urban environments. Ozone affects the respiratory system in people and animals, and it affects the growth of plants. The primary route of entry into the body is inhalation, and symptoms of O_3 exposure generally involve the lungs. Symptoms can include coughing, a sore or scratchy throat, shortness of breath, chest pain on deep inhalations, increases in asthma attacks, and damage to the lungs. Children are the population at greatest risk due to several factors: their lungs are still developing; they are more likely to be active outdoors when O_3 levels are high; and they are more likely to have asthma than adults are. It has been widely documented that O_3 even at low concentrations causes damage to plants and reduces crop yields, resulting in it being considered by plant scientists as the most important phytotoxic air pollutant.

The first NAAQS regulating O_3 levels was implemented in 1971. The 1971 NAAQS included a primary and secondary 1-hour level of 0.08 ppm (80 ppb) for "total photochemical oxidants" (TPO). This level could not be exceeded more than 1-hour per year. The TPOs are "precursors" to O_3 development and were used as the "indicator compound(s)" to ascertain O_3 concentrations. These compounds are used widely in industry and include reactive VOCs.

After scientific review, the EPA revised the NAAQS in 1979, establishing O_3 as the indicator compound, or chemical. Both primary and secondary NAAQS changed to an annual 1-hour level of 0.12 ppm (120 ppb) for O_3 only. From 1979 to date, the O_3 NAAQS levels have been established using O_3 concentrations only. In 1997, EPA revised both O_3 NAAQS by establishing an 8-hour level of 0.08 ppm (80 ppb). The 1997 NAAQS introduced a new averaging time for determining compliance. Compliance with the revised NAAQS was determined when the 4th highest daily O_3 maximum 8-hour average over three years was less than or equal to 0.08 ppm (80 ppb).

In March 2008, the EPA further reduced the primary and secondary 8-hour O_3 NAAQS from 0.080 to 0.075 ppm (75 ppb). Compliance with the NAAQS is determined by averaging the 4th highest 8-hour average over a 3-year period, which must be less than or equal to 0.075 ppm.

In December 2015, the EPA lowered both the primary and secondary 8-hour O_3 NAAQS levels to 0.070 ppm (70 ppb). Compliance with the NAAQS is determined by averaging the 4th highest 8-hour average over a 3-year period, which must be less than or equal to 0.070 ppm.

Regarding Maricopa County's status with the NAAQS, we have attained the 1979 1-hour standard. The EPA revoked the 1979 1-hour NAAQS for the Phoenix-Mesa nonattainment area in 2005. In addition, the Phoenix-Mesa nonattainment area for the 1997 8-hour O_3 NAAQS is now in attainment. When the 2008 NAAQS became effective in May 2008, O_3 concentrations in the County had improved, but exceeded the new level. This led to EPA designating portions of Maricopa and Pinal Counties as nonattainment for the 2008 O_3 NAAQS in 2012. Otherwise, the EPA has redesignated the state of Arizona as in attainment for the 2008 O_3 NAAQS effective October 17, 2014.

In 2018, there were 47 days when at least one O_3 monitor exceeded the 2015 8-hour NAAQS, and eleven monitors violated the standard. For more information regarding the O_3 exceedance days and NAAQS violations, see the Summary of 2018 Criteria Pollutant NAAQS Status section.

Particulate Matter (PM)

Particulate matter is a collective term describing very small solid or liquid particles that vary considerably in size, geometry, chemical composition, and physical properties. Numerous chemical components may be present in particle pollution including acids, nitrates, sulfates, organic chemicals, metals, soils, and finer dust particles. Particulates can be formed by natural processes, such as pollen production and wind erosion, and anthropogenic activities, such as commercial/industrial/agricultural operations and motor vehicle use. Particulates contribute to visibility reduction, pose a threat to public health, and cause economic damage.

The EPA currently regulates PM pollution using two size categories:

- "PM_{10}", particles with size range ≤10 micrometers (μm) in aerometric diameter; and
- "$PM_{2.5}$", aka "fine particles", particles with a size range of ≤2.5 μm in aerometric diameter.

The larger particles that make up PM_{10} form through mechanical processes such as the grinding of matter and the atomization of liquids, natural weathering processes, and anthropogenic activities that disturb soil. In Arizona, elevated concentrations of PM_{10} are associated with people driving on unpaved roads, dusty industries, and dust storms related to high wind events.

Fine particulates are formed by the incomplete combustion of fossil fuels, the condensation of vapors, and photochemical processes. Fine particulates are further classified as "primary", meaning they are produced within and emitted directly from a source such as exhaust from a diesel engine or smoke from a fire. "Secondary" particulates form in the atmosphere from gaseous pollutants. Nitrates and sulfates are formed by the photochemical oxidation of gaseous NO_2 and SO_2, respectively. In addition, secondary organic carbon particles form through a photochemical transformation of gaseous organic compounds.

The primary route of entry for PM_{10} into the body is through inhalation. The size, shape, and chemical composition of particulates determine the health effects that may result from PM exposures. The potential for causing health problems is directly linked to particle size. Smaller particles are more toxic than larger particles because of the higher relative content of toxic metals and ions combined with the increase of particle surface area. The EPA is concerned about particles ≤10 μm in diameter, because those are the particles that generally pass through the throat and nose and enter the lungs. Coarser particles are deposited in the upper parts of the respiratory system, but finer particles are deposited deeper into the respiratory system. Fine particles are small enough to be deposited in the lung's alveoli, which are tiny air sacks deep inside the lungs. Some research shows that the smallest of particles may enter the bloodstream as well. Currently, research is underway to better understand the health effects of ultrafine particles.

The populations most at risk from particulate exposure are older adults, diabetics, and children; because children tend to be more physically active and that causes them to breath faster and deeper. Once inhaled, these particles can cause serious heart and lung health effects that affect both humans and animals. Epidemiological studies show that long-term, chronic exposures, i.e., years of exposure to high levels of particulates, are associated with reduced lung function, the development of chronic bronchitis, and premature death. Studies show that short-term, acute exposures, i.e., hours to days of exposure to high levels of particulates, can aggravate lung disease, asthma attacks, acute bronchitis,

and may increase susceptibility of respiratory infections. For those with heart disease, it can induce heart attacks. Exposure to acidic aerosols, i.e., acidic particles with an aerometric diameter of about 0.01 – 100 μm, have been linked to the upper respiratory tract and pulmonary system's inability to remove harmful particles.

In 1987, the EPA replaced the 1971 Total Suspended Particulates (TSP), i.e., particles around 40 μm and less in aerometric diameter, with the primary and secondary NAAQS for PM_{10}. The EPA revoked the annual PM_{10} NAAQS in 2006. Currently, the 24-hour primary and secondary levels for PM_{10} are both 150 $\mu g/m^3$ as per the 1987 NAAQS. In 2012, the PM_{10} NAAQS underwent review with exposure to $PM_{10-2.5}$ also being considered. This review resulted in EPA retaining the existing primary and secondary 24-hour PM_{10} NAAQS, which is considered to provide for protection against effects associated with acute exposure to $PM_{10-2.5}$.

In 1997, the EPA reviewed and updated the $PM_{2.5}$ NAAQS levels. Since then, these NAAQS have been reviewed in 2006 and 2012 with some levels being made more stringent. On December 14, 2012, EPA retained the primary 24-hour $PM_{2.5}$ standard of 35.0 $\mu g/m^3$, but reduced the primary and secondary NAAQS annual $PM_{2.5}$ level to 12.0 $\mu g/m^3$ and 15.0 $\mu g/m^3$, respectively. While Maricopa County is currently in attainment for $PM_{2.5}$, we tend to experience 24-hour exceedances during the colder, winter months, especially from Thanksgiving into January. In colder months, smoke from residential fireplaces coupled with the temperature inversions tends to drive up $PM_{2.5}$ concentrations throughout the metropolitan area.

To address this problem, ADEQ and Maricopa County worked together on a public outreach campaign to reduce wood burning within the County around the fall/winter holidays. Maricopa County's umbrella dust abatement rule, *Rule 310 – Fugitive Dust From Dust-Generating Operations*, has been revised many times through the years. *Rule 310* regulates construction dust, trackout dust, and dust from unpaved parking and vacant lots. The recent PM_{10} SIP includes seventy-seven new measures to enhance enforcement of the rule, implementation of agricultural best management practices, diesel engine replacement and retirement programs, and requirements for cleaner burning fireplaces to further reduce $PM_{2.5}$ emissions.

The western U.S. has a unique problem with respect to exceedances of the PM NAAQS. It has been acknowledged for decades that exceedances of the PM NAAQS due to blowing dust and smoke from massive wildfires may be "exceptional" in nature, i.e., not expected to recur or caused by acts of nature that overwhelm emission controls. Initially by policy, and later by rule, EPA established procedures and standards for documenting whether an exceedance of the NAAQS is the result of an "exceptional event" (EE) and if the pollutant data should be excluded from NAAQS compliance determinations. In 2007, EPA adopted the *Treatment of Data Influenced by Exceptional Events (EER)* rule that covers how to prepare an EE package for EPA's review and how to manage event-related data. In the past few years, most exceedances of the PM_{10} NAAQS within Maricopa County have been successfully shown to meet the EE requirements. Exceptional event information for 2016-2018 is shown in the 2018 Summary of Network Results and Required Information section.

In 2018, there were fourteen days when at least one PM_{10} monitor exceeded the 1987 24-hour PM_{10} NAAQS level, but no monitors violated this NAAQS. For $PM_{2.5}$, there were eight days when at least one monitor exceeded the 2012 24-hour NAAQS level, but no monitors violated the NAAQS. For more information regarding the PM exceedance days and NAAQS violations, see the Summary of 2018 Criteria Pollutant NAAQS Status section.

Sulfur Dioxide (SO_2)

Sulfur dioxide is a colorless gas with a pungent irritating odor at elevated concentrations. It is emitted primarily from the burning of high-sulfur coal, oil, and diesel fuel, and the smelting of metals like copper. Most fuels contain trace quantities of sulfur. When fuels burn, both gaseous SO_2 and sulfate particles are released into the air due to incomplete combustion of the fuel. Consequently, separating the health effects of these two chemicals is difficult. Together, SO_2 and $PM_{2.5}$ act separately and together to threaten public health and can make up a major portion of pollution in many cities. Sulfur dioxide is removed from the atmosphere through dry deposition, and it is converted to sulfuric acid, and eventually sulfate particles. Both contribute to public health problems and negatively affect the environment. The SO_2 and sulfate from vehicular emissions have been significantly reduced over the years through lowering the sulfur content in diesel fuel and gasoline.

Sulfur dioxide's primary route of entry into the body is by inhalation. It contributes to respiratory illness, particularly in children and the elderly, and aggravates existing heart and lung diseases. Sulfur dioxide contributes to the formation of acid rain, and it contributes to the formation of atmospheric particles that cause visibility impairment, most notably in national parks. Sulfur dioxide and the pollutants formed from SO_2, such as sulfate particles, can be transported over long distances and deposited far from the point of origin. This means that problems associated with SO_2 are not confined to areas where it is emitted.

In Maricopa County, mobile and industrial sources emit the majority of SO_2. The majority of statewide SO_2 emissions occurs in eastern Arizona and is produced by coal-based electricity generation, the smelting of non-ferrous sulfide copper ore, and smoke from wildfires. Major controls were installed in Arizona's copper smelters in the 1980s, which reduced SO_2 emissions substantially. In addition, most of the copper ore smelters that used to operate have been shutdown, which reduced SO_2 emissions in localized areas around the state.

The EPA first established primary and secondary NAAQS for SO_2 in 1971. The NAAQS levels changed in 1973 and 2010. In 2010, EPA revised the primary SO_2 NAAQS by revoking an annual level of 0.03 ppm (3 ppb) and the 24-hour level of 0.14 ppm (14 ppb). In February 2019, EPA retained the 2010 NAAQS levels following CASAC's most recent review. Currently, the primary SO_2 NAAQS is a 1-hour level of 75 ppb, and the secondary NAAQS is 0.5 ppm (500 ppb). Compliance with the primary NAAQS is determined by averaging the 99^{th} percentile of 1-hour daily maximum concentration average over a 3-year period, which cannot be greater than 75 ppb. For compliance with the secondary NAAQS, a 3-hour average cannot exceed a concentration of 0.5 ppm more than once per year.

In 2018, there were no exceedances or violations of the primary or secondary SO_2 NAAQS. Currently, Maricopa County is in attainment for SO_2. The AMD operates two year-round SO_2 monitoring stations, and the siting of SO_2 monitors meets EPA requirements.

AIR MONITORING STRATEGIES AND SURVEILLANCE SYSTEM DESIGN

Overview of Air Monitoring Requirements and System Design

The AMD monitors for the six CPs by operating and maintaining 24 ambient air monitoring sites located throughout Maricopa County. The sites' start-up dates range from 1961 for Central Phoenix to 2015 for Thirty-Third. Land use patterns around the sites vary from densely populated urban areas to sparsely populated rural settings. The sites' elevations range from 845 feet above sea level at Buckeye to 5190 feet above sea level at the top of Humboldt Mountain. Some sites measure many pollutants, while others may only measure one or two. The MCAQD chose each site and its pollutant monitors based on specific EPA requirements as described below, special requests from EPA, and/or specific needs of the County.

The *40 CFR Parts 50, 53, and 58* provides the requirements for operating an ambient air monitoring program. The MCAQD is fully responsible for designing and operating the total air monitoring surveillance system and managing the pollutant data generated. The MCAQD holds the Primary Quality Assurance Organization (PQAO) designation for the County's ambient air monitoring network, which basically means that we do not share QA roles and/or responsibilities with another MO. The MCAQD operates air monitors at EPA-approved State and Local Air Monitoring Stations (SLAMS), which includes the near-road NO_2 stations. On occasion, special air monitoring initiatives involve temporarily operating CP monitors designated as Special Purpose Monitors (SPM), as well as PM speciation and air toxics monitors.

This section details how each CP network is designed to obtain "representative" data. The *40 CFR Part 58 Appendix D* covers the requirements for designing the air monitoring network and is summarized in this section. To determine compliance with the NAAQS, EPA-approved air monitors must collect the CP data. The EPA classifies approved monitor methods into one of three categories: a federal reference method (FRM), a federal equivalent method (FEM), or an approved regional method (ARM). The MCAQD uses FRM and FEM instruments. This practice ensures high-quality data of like kind are used for compliance-driven decisions.

However, data from research monitors, e.g., non-compliance monitors, can be used to develop state and/or federal attainment and maintenance plans, further evaluate regional air quality models used in developing emissions control strategies, tracking trends in air pollution, and evaluating the impact control measures are having on improving air quality. Any short-term research data collected by the MCAQD can be made available to decision makers; but the data are not reported to AQS.

Within Maricopa County, the ADEQ collects compliance data as well as research data at the JLG Supersite via the following EPA monitoring networks: National Core multi-pollutant site (NCore), Photochemical Ambient Monitoring Stations (PAMS), Chemical Speciation Network (CSN), and National Air Toxics Trends Stations (NATTS). The ADEQ also collects air toxics samples for the Urban Air Toxics Monitoring Program (UATMP) at MCAQD's South Phoenix site. In addition, ADEQ collects PAMS data east of Maricopa County, near Queen Valley, which is in Pinal County. The data from these networks are reported to EPA and should be available in AQS and/or another EPA database.

In addition to producing an annual network plan, the EPA now requires a five-year network assessment as per *40 CFR Part 58.10*. The 5-year assessment is best served by collaborating with EPA, ADEQ, and other local and/or tribal MOs. The first assessment was produced in 2010 and the second was produced in 2015. The assessment process continues to improve, and MCAQD works with other MOs regarding CP network design issues as needed. The MOs within Arizona may provide support to each other by exchanging technical services and/or knowledge when problems arise with instrumentation or when conducting special studies.

Basic Air Monitoring Objectives

Each ambient air monitor must have a designated basic monitoring objective. The three objectives below apply to establishing required SLAMS monitoring stations and choosing the general locations for additional monitoring sites. This appendix further describes specific requirements for specific pollutants as well as other air monitoring networks not operated by the MCAQD such as NCore, PAMS, PM speciation and O_3 precursors. The objectives are not listed based on importance or priority. Each objective is important and must be considered individually. Table 2 shows the three basic objectives.

Table 2. Basic SLAMS Air Monitoring Objectives

Objective	Description
Provide air pollution data to the general public in a timely manner	Data can be presented to the public in a number of attractive ways including: air quality maps, newspapers, MOs and EPA websites, and as part of weather forecasts and public advisories.
Support compliance with ambient air quality standards and emissions strategy development	Data from EPA-approved monitors for NAAQS pollutants will be used for comparing an area's air pollution levels.
Support for air pollution research studies	Supplemental data useful with health effect assessments, atmospheric processes, or monitoring methods development work.

Source: *40 CFR Part 58 Appendix D, 1.1(a – c)*

Monitor Types

Each pollutant monitor must be designated one of three types. The monitor type is based upon how the data will be used and how long the monitor will remain in operation. Table 3 shows the three monitor types defined by EPA in *40 CFR Part 58*.

- The first type of monitor is a "State/Local Air Monitoring Station", or SLAMS. The MCAQD's air monitoring network is comprised of SLAMS, which gather data for comparison to the NAAQS. The monitors operating within the near-road, NCore, PAMS, NATTS, and UATMP networks are a subset of SLAMS.

- The second type of monitor is a "Special Purpose Monitor", or SPM. The MCAQD may operate SPMs temporarily; however, we did not in 2018. These monitors are useful for gathering and reporting preliminary information regarding air quality in a local area quickly and over a short-term period, which is less than two years. In the event of a geographical area's population increasing or data indicating that a SLAMS is more appropriate; an SPM may be reclassified to SLAMS and potentially outfitted with a different method. The *40 CFR Part 58.20 Subpart C* states that:

  > *"An SPM is defined as any monitor included in an agency's monitoring network that the agency has designated as a special purpose monitor in its annual monitoring network plan and in AQS, and which the agency does not count when showing compliance with the minimum requirements of this subpart for the number and siting of monitor of various types. Any SPM operated by an air monitoring agency must be included in the period assessments and the annual monitoring network plan".*

- The third type of monitor is a PSD, and it is operated for the purpose of establishing the effect on air quality of the emissions from a proposed source for purposes of preventing significant deterioration to a "protected" area, e.g., a Class 1 area. Class 1 areas include national parks and wilderness areas where a major effort is underway to improve visibility and air quality. There are no Class 1 areas within Maricopa County; however, Arizona does have twelve Class 1 areas under the protection of the Visibility and Regional Haze program.

Table 3. Monitor Types

Name	Description of Use
SLAMS	EPA-approved, compliance monitor typically operated on a long-term basis.
SPM*	A monitor typically operated on a short-term basis and not necessarily EPA-approved.
PSD	A monitor typically operated for less than two years prior to a source opening in a protected Class A area and usually required by the permitting authority.

* Reference *40 CFR Part 58* for important EPA's requirements regarding SPM monitor operation. Usually, if the SPM operates for more than two years and meets *40 CFR Part 58 Appendix D* siting requirements, removing it will need prior approval by EPA.

Site Types

To support the three basic monitoring objectives, each site must be identified as one of the six "site types" shown below. Site types may vary within each pollutant's network. The site type is key to informing air quality professionals and the public about a pollutant's peak concentration levels. Table 4 shows the site types as defined by EPA.

Table 4. Site Types

Determine the ***highest concentrations*** expected to occur in the area covered by the network.
Measure typical concentrations in areas of ***high population density (population exposure)***.
Determine the impact of significant ***sources*** or source categories on air quality.
Determine general ***background concentration*** levels.
Determine the extent of ***regional pollutant transport*** among populated areas and in support of secondary standards.
Measure air pollution ***impacts to visibility, vegetation damage, or other welfare-based impacts***.

Source: Adapted from *40 CFR Part 58, Appendix D.1*

Monitoring Scales (Spatial Scales of Representativeness)

To help link the site type with a monitor's basic monitoring objective and physical location, EPA developed the "spatial scale of representativeness" concept. As per *40 CFR Part 58, Appendix D 1.2 (a) and (b):*

> "*The goal in locating air monitors is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring site type, air pollutant to be measured and the monitoring objective. Thus, spatial Scale of representativeness is described in terms of physical dimension of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar".*

Table 5 shows six scales of representativeness that are of most interest for the air monitoring site types described above.

Table 5. Spatial Scales of Representativeness

Name	Distance
Micro Scale	0 to 100 meters
Middle Scale	100 to 500 meters
Neighborhood Scale	0.5 to 4 kilometers
Urban Scale	4 to 50 kilometers
Regional Scale	10s to 100s of kilometers
National and Global Scales	Characterize the nation and the globe as a whole

Source: Adapted from *40 CFR Part 58, Appendix D 1.2*

Locating Air Monitoring Sites

The air monitoring network is designed to provide pollutant data that represents County-wide "ambient" air quality. EPA defines ambient air as "the air to which the public has access". Since it is physically and fiscally impossible to monitor the air in every location, each monitor's objective, the associated site type, and corresponding spatial scale of representativeness most appropriate for the CP to be measured are foremost in determining each site's location. In addition to correctly integrating the above considerations, a site's location must also have reasonable accessibility, security, and operating feasibility, such as a property owner's agreeability to have monitoring conducted on their land and a clean power supply.

For example, consider the case where the objective is to determine NAAQS compliance by understanding the maximum O_3 concentrations for an area. Such areas would most likely be located downwind of a metropolitan area in a suburban residential area where children and other susceptible individuals are likely to be outdoors. Sites located in these areas are most likely to represent an urban scale of measurement. In this example, O_3 precursor emission patterns, public activity, and meteorological characteristics that affect O_3 formation and dispersion were considered when selecting an O_3 monitoring site's physical/geographical location; and, the spatial scale of representativeness was a result of the selection process.

When applying these principles, the total quantity of monitoring sites that will serve the variety of data needs is often substantially higher than federal minimum requirements. The optimal size of each pollutant's network involves compromises among data needs and available resources; and, a network's size can change over time. Each pollutant's network must be dynamic enough to maintain a current representative sampling of the air quality.

Daily Uses of Criteria Pollutant Data

Air Quality Forecasting

The ADEQ, in conjunction with MCAQD, has developed a year-round air quality forecasting capability for the Phoenix metropolitan area. ADEQ takes the lead on air quality forecasting and the issuing of a High Pollution Advisory (HPA) or a Health Watch (HW), while the MCAQD provides monitoring data and designates No-Burn Days. In 2018, AMD continued to supply CP and meteorological data to the AirNow website and MAG planners daily.

Maricopa County's Air Monitoring Webpage

The department continued distributing 1-hour and 5-minute continuous CP data for the Maricopa County Interactive Pollution Map. The interactive map provides each pollutant's either 5-minute or up-to-the-hour concentrations as well as AQI values. In 2018, MCAQD continued posting Yesterday's Data Review to the air monitoring webpage. It provides a lookback of yesterday's PM_{10}, $PM_{2.5}$, and O_3 concentrations. The MCQAD website continues to provide easy access to air monitoring data so the public can better plan their daily activities.

EPA's AIRNow Website

The department continued distributing 1-hour continuous CP data for the EPA's AIRNow website, which serves the same purpose as that of the Maricopa County's website.

Overview of the Air Monitoring Sites

According to the U.S. Census Bureau, Maricopa County's most recent population estimate is 4,307,033 people (U.S. Census Bureau: Vintage 2017 Population Estimates). As per *40 CFR Part 58*, the EPA mandates the minimum quantity of monitors required by a pollutant's network to properly represent the County's population. As previously mentioned, the MCAQD pollutant networks are designed using the concept of spatial scale representativeness and monitoring objectives. This results in CP networks that meet, and in most cases exceed, the minimum quantity of monitors required by EPA. Additional information on the siting of air monitors can be found in the Appendix II.

The following tables show details regarding each site's MCAQD name and abbreviation, EPA's AQS identification number, geographic coordinates, and the full complement of air monitors and/or sensors at each site.

Table 6 shows the MCAQD's site names, abbreviations, and the AQS identification number.

Table 6. Monitoring Site Identification Information

Name	AMD Abbreviation	AQS ID
Blue Point	BP	04-013-9702
Buckeye	BE	04-013-4011
Cave Creek	CC	04-013-4008
Central Phoenix	CP	04-013-3002
Deer Valley	DV	04-013-4018
Diablo	DI	04-013-4019
Durango Complex	DC	04-013-9812
Dysart	DY	04-013-4010
Falcon Field	FF	04-013-1010
Fountain Hills	FH	04-013-9704
Glendale	GL	04-013-2001
Higley	HI	04-013-4006
Humboldt Mountain	HM	04-013-9508
Mesa	ME	04-013-1003
* North Phoenix	NP	04-013-1004
Pinnacle Peak	PP	04-013-2005
South Phoenix	SP	04-013-4003
South Scottsdale	SS	04-013-3003
Tempe	TE	04-013-4005
Thirty-Third	TT	04-013-4020
West Chandler	WC	04-013-4004
West 43rd	WF	04-013-4009
West Phoenix	WP	04-013-0019
Zuni Hills	ZH	04-013-4016

* - Site(s) experienced a monitoring interruption in 2018 due to property, building, and/or infrastructure upgrades.

Table 7 shows the specific geographic coordinates for the location of each site.

Table 7. Monitoring Site Locations

Site	AQS ID#	Latitude	Longitude	Location
BE	04-013-4011	33.36985	-112.62068	MC Hwy. 85 & AZ Hwy. 85
BP	04-013-9702	33.54558	-111.60972	Usery Pass & Bush Hwy.
CC	04-013-4008	33.82169	-112.01726	32nd St. & Carefree Hwy.
CP	04-013-3002	33.45797	-112.04659	19th St. & Roosevelt St.
DV	04-013-4018	33.68449	-112.08633	10th Ave. & Deer Valley Rd.
DC	04-013-9812	33.42650	-112.11821	27th Ave. & Durango St.
DY	04-013-4010	33.63718	-112.34185	Bell Rd. & Dysart Rd.
DI	04-013-4019	33.39623	-111.96799	Fairmont Dr. & Diablo Way
FF	04-013-1010	33.45224	-111.73327	McKellips Rd. & Greenfield Rd.
FH	04-013-9704	33.61092	-111.72534	E. Palisades Blvd. & Fountain Hills Blvd.
GL	04-013-2001	33.30995	-111.72003	59th Ave. & W. Olive Ave.
HI	04-013-4006	33.30995	-111.72003	Higley Rd. & Williams Field Rd.
HM	04-013-9508	33.98280	-111.79871	Top of Humboldt Mountain
ME	04-013-1003	33.41018	-111.86536	Broadway Rd. & Alma School Rd.
NP	04-013-1004	33.56031	-112.06619	7th St. & Dunlap Ave.
PP	04-013-2005	33.70639	-111.85575	Alma School Rd. & Happy Valley Rd.
SP	04-013-4003	33.40314	-112.07526	Central Ave. & Broadway Rd.
SS	04-013-3003	33.47968	-111.91711	Scottsdale Rd. & Miller Rd.
TE	04-013-4005	33.41123	-111.93471	College Ave. & Apache Blvd.
TT	04-013-4020	33.46173	-112.12796	Interstate 10 & 33rd Ave.
WC	04-013-4004	33.40635	-112.14426	Ellis St. & Frye Rd.
WF	04-013-4009	33.29896	-111.88426	43rd Ave. & Broadway Rd.
WP	04-013-0019	33.48378	-112.14256	39th Ave. & Earll Dr.
ZH	04-013-4016	33.68719	-112.29416	109th Ave. & Deer Valley Rd.

Source: EPA AQS database – *Site Description Report (AMP380)*

Figure 6 provides the complement of air monitoring instruments operating at each site in 2018.

Maricopa County - Air Monitoring Site Instrumentation

Site	AQS Code	CO	NO_2	O_3	SO_2	PM_{10}	$PM_{2.5}$	$PM_{2.5}$ Filter	Pb Filter	H_2S	WS / WD	Baro Press	Delta T	Amb Temp	Rel Hum	Rain	Solar Rad	Room	Multi-Gas Cal	Active Instruments
BE	04-013-4011	1	1	1		1					1	1		1	1			1	1	10
BP	04-013-9702			1							1			1	1			1		5
CC	04-013-4008			1							1			1	1	1		1		6
CP	04-013-3002	1	1	1	1	1					1	1		1				1	1	10
DC	04-013-9812				1	1	1				1	1		1	1			1	1	9
DI	04-013-4019	1	1				1				1			1	1			1	1	8
DV	04-013-4018								2		1	1		1	1			1		7
DY	04-013-4010			1		1					1	1		1	1			1		7
FF	04-013-1010			1							1			1	1			1		5
FH	04-013-9704			1							1	1		1	1			1		6
GL	04-013-2001			1		1	1				1	1		1	1			1		8
HI	04-013-4006					1					1	1	1	1				1		6
HM	04-013-9508			1							1			1	1			1		5
ME	04-013-1003	1		1		1	1				1	1		1	1			1		9
MM	Not Applicable	1	1		1	1	1			1	1	1		1	1		1	1	1	13
NP	04-013-1004			1		1	1				1	1	1	1			1	1		9
PP	04-013-2005			1							1	1		1	1			1		6
SP	04-013-4003	1		1		1	1				1	1		1	1			1		9
SS	04-013-3003			1		1					1	1		1	1			1		7
TE	04-013-4005			1		1	1				1		1	1		1		1		8
TT	04-013-4020		1								1			1				1	1	5
WC	04-013-4004	1		1		1					1	1		1	1			1		8
WF	04-013-4009					1					1	1	1	1				1		6
WP	04-013-0019	1	1	1		1	1	1			1	1	1	1				1	1	12
ZH	04-013-4016					1					1			1						3
Active Instruments		**8**	**6**	**17**	**3**	**16**	**9**	**1**	**2**	**1**	**25**	**17**	**5**	**25**	**17**	**2**	**2**	**24**	**7**	

Total # of Criteria Pollutant Monitors **62**
Total # of Active Instruments **187**
Total # of Active Sites **24**
Mobile Truck **1**

NOTES:
MM = Mobile Monitoring Truck (Intermittent Monitoring)

Last updated: CLS 01/07/19

Figure 6. 2018 Air Monitoring Instruments by Site

2018 SUMMARY OF NETWORK RESULTS AND REQUIRED INFORMATION

Determining Data Quality and Acceptability

This section details the results obtained from our 2018 monitoring year. The EPA has established data quality and measurement quality objectives for CP data. In addition to *40 CFR Part 58*, the EPA *QA Handbook for Air Pollution Measurement Systems: "Volume II: Ambient Air Quality Monitoring Program* provides extensive information regarding the quality system and its components. There are seven data quality indicators (DQI) established by the EPA to determine the quality of ambient air data. Data must meet each indicator's requirement to be certified and acceptable for use by decision makers for NAAQS compliance determinations, researchers, and the public.

These indicators are precision, bias, completeness, comparability, detectability, representativeness, and sensitivity. "Timeliness" of data collection, validation, and upload to AQS are important as well. "Accuracy" is now defined as a measure of the overall agreement of a measurement to a known value and includes a combination of random error (precision) and systematic error (bias) components of both sampling and analytical operations. The AMD's personnel evaluate data using these indicators, with precision, bias, and completeness being the most crucial to evaluate on an ongoing basis.

Data Completeness

Before considering any data set valid, it must first pass a data recovery, or completeness, test. The test requirements begin with checking completeness at hourly and 24-hour concentration values. These values may be referred to as "samples". The CP pollutant data measurements from continuous analyzers are based on a valid hour, while filter samples from manual samplers are based on a 24-hour sampling period from midnight to midnight. Equation 1 shows the calculation for the data completeness percentage, which is the quantity of valid measurements divided by the quantity of scheduled measurements multiplied by one-hundred. For CP data, completeness must be greater than 75% for a data set to pass the first validity test. Furthermore, CP data completeness requirements may vary and use multiple levels of data aggregation, e.g., 1-hour, 3-hour, 8-hour, 24-hour, quarterly, annual, and multiple years.

Equation 1:

$$\textbf{Data Completeness Percentage} = \frac{\textbf{Qty. of Valid Measurements}}{\textbf{Qty. of Measurements Scheduled}} \textbf{ (100)}$$

Table 8 shows the pollutant data completeness percentages for 2018.

Table 8. 2018 Criteria Pollutant Data Completeness for SLAMS

Pollutant	CO	Pb	O_3	NO_2	SO_2	$PM_{2.5}$	PM_{10}	TOTAL
Percent Complete	98.6	100.0	98.7	98.2	97.0	98.1	98.3	98.4

Source: EPA AQS database - *2018 Data Completeness Report (AMP430)*

Increasing Data Volumes

Due to increasing data requirements and the availability of FEM analyzers, the amount of data the AMD produces increased considerably over the past few years. Operating and maintaining the various components of each air monitoring network is an ongoing challenge. To remain current with EPA's requirements and to meet decision makers and researchers' data needs, AMD personnel adjust standard operating procedures according to EPA's latest requirements and/or guidance to ensure only high-quality data are being produced. In addition to the increased amount of CP data generated and managed, supporting components of the surveillance system such as the communications system to the sites and the database used for data management also need continuing upgrades. So far, AMD has managed to make significant program changes to keep up with the increasing demand for data. By automating some processes, we have been able to successfully respond to data needs without increases to personnel. The following information summarizes a few notable changes that have been implemented to date.

- The commercial database, AirVision™, has enhanced our ability to manage the increase in data volume. It has helped to advance data validation and dissemination, as well as data retrieval/storage/security. The database must be maintained and updated regularly to keep up with software changes involving data collection, validation, and reporting to AQS.

- AirVision™ also allows AMD personnel to perform multiple data checks throughout the workday to help prevent bad data from being released to the public via the County and EPA's websites. In addition, it is used to upload preliminary data to the MC website as close as possible to real-time.

- A Rapid Response Notification System (RRNS) was implemented to better manage quickly-developing pollution events. The RRNS uses automated alarms to monitor instrument performance and incoming pollutant concentrations. The triggering instrument warning and pollutant concentration levels can be adjusted as needed for each alarm. The AirVision™ database is programmed to automatically generate these alerts.

Table 9 shows the amount of 1-hour data AMD has been producing per year, plus the near eightfold increase of data produced when AMD started collecting 5-minute data.

Table 9. Approximate Amount of 2018 Data Produced

Type	1-Hour CP Data	1-Hour CP and Met Data	1-Hour, 5-Minute and 24-Hour CP and Met Data
Amount	550,000	1,010,000	10,000,000

Summary of 2018 Criteria Pollutant Data

This section covers the 2018 data generated by each CP's network.

Carbon Monoxide (CO)

Figure 7 shows the CO monitoring sites operating at the beginning of 2018. The network is comprised of seven year-round CO monitors.

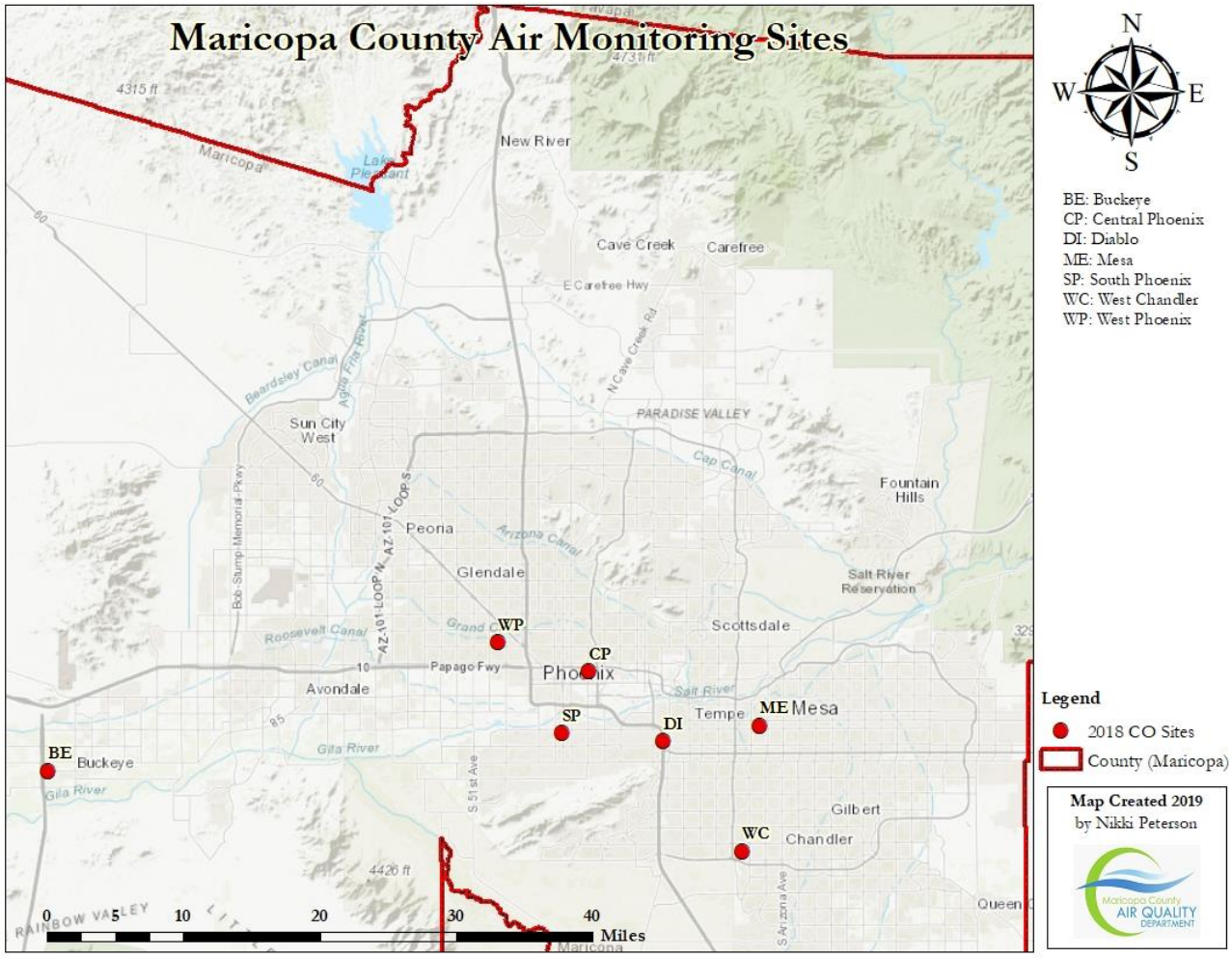


Figure 7. 2018 CO Monitoring Site Map

There are two primary standard levels for CO: an 8-hour average of 9 ppm and a 1-hour average of 35 ppm. A violation of either standard is based on two exceedances in a calendar year. For 2018, the data from the CO monitors were reported to AQS, and the data are suitable for comparison to the NAAQS.

The Phoenix metropolitan area was once designated as being in moderate nonattainment for CO for the 1971 primary NAAQS. A nonattainment SIP was developed by ADEQ that covered how to reduce and maintain CO concentrations. The area failed to reach attainment by the end of 1995, which caused EPA to reclassify the area to serious nonattainment in 1996, with a new attainment date of December 31, 2000. In response, the Governor's Office, Legislature, Maricopa County, and other entities worked cooperatively to find ways to reduce CO that included implementing innovative programs such as a nationally recognized, enhanced vehicle emissions inspection program, a cleaner burning gasoline program, pollution reduction measures for commercial and industrial sources, and woodburning restrictions. As a result, CO concentrations declined and data showed that the area had reached attainment with the 8-hour primary NAAQS.

In April 2005, the EPA redesignated the Phoenix metropolitan area to attainment for CO and approved the attainment demonstration and maintenance plan, which shows how the area will maintain compliance with the CO NAAQS through 2015. However, Maricopa County must continue to show that the air quality is maintaining compliance with the NAAQS for a period of 20 years from the attainment determination. The area is now covered by a 10-year maintenance SIP.

In 2018, no exceedances of the 1-hour or 8-hour CO NAAQS occurred at any MCAQD sites, and concentrations remained well below NAAQS levels. Since 1-hour CO concentrations have been significantly lower than the NAAQS level for many years, we have not included this metric on a table. Table 10 shows the maximum and second highest 8-hour CO averages measured.

Table 10. 2018 8-hour CO Average Data Summary

Site	CO 8-hour Average Maximum (ppm)	CO 8-hour Average 2nd Maximum (ppm)
Buckeye	0.6	0.5
Central Phoenix	2.4	1.9
Diablo	1.6	1.4
Mesa	1.4	1.3
South Phoenix	3.2	2.0
West Chandler	1.7	1.4
West Phoenix	4.4	2.9

Source: EPA AQS database – *2018 Quicklook Criteria Report (AMP450)*

Table 11 shows additional CO information required by EPA for the Phoenix core-based statistical area (CBSA), which includes Maricopa and Pinal Counties.

Table 11. 2018 CO Data Required by EPA

CBSA	Population & Census Year (2017)	Required Near-Road Monitors	Active Near-Road Monitors	Additional Near-Road Monitors Needed
38060	4,307,003	1	1	0

Source: U.S. Census Bureau: Vintage 2017 Population Estimates

Nitrogen Dioxide (NO_x)

Figure 8 shows the five NO_2 monitoring sites operating in 2018.

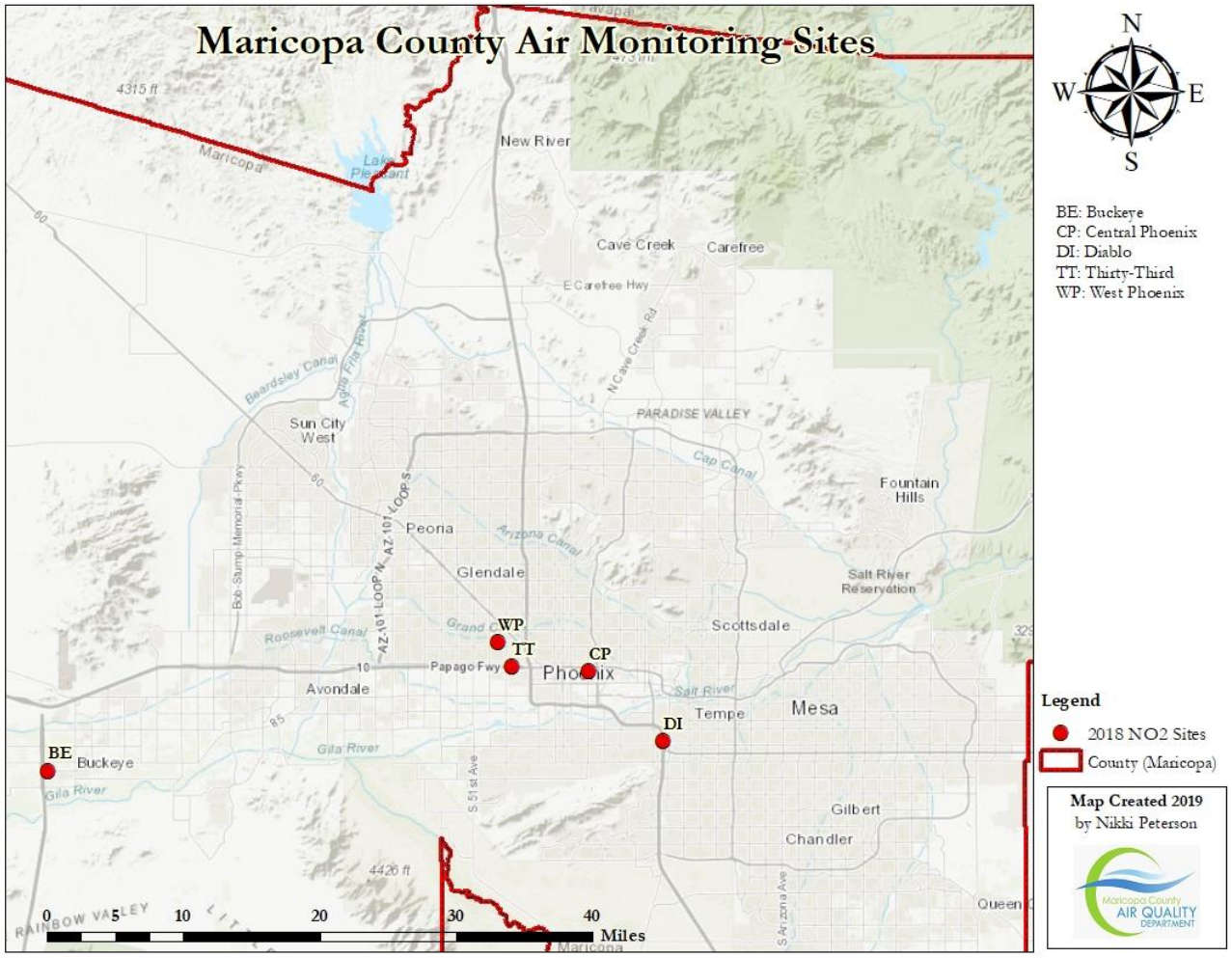


Figure 8. 2018 NO_2 Monitoring Site Map

The five NO_2 monitors are designated as SLAMS; however, they are further designated as being either an "area-wide" or "near-road" monitor. At the Buckeye, Central Phoenix, and West Phoenix sites, the monitors are area-wide monitors and represent what NO_2 concentrations are within Maricopa County. At the Diablo and Thirty-Third sites, the monitors are near-road monitors and represent NO_2 concentrations close to heavily travelled highways within Maricopa County.

Data from both the area-wide and near-road monitors were reported to AQS, and the data are suitable for comparison to the NAAQS. Maricopa County is in attainment for NO_2. Compliance with the NO_2 standard is achieved when the annual arithmetic mean concentration in a calendar year is less than or equal to 53 ppb. A new hourly standard for NO_2 began in 2010; this regulation states that the 3-year average of the 98th percentile cannot exceed 100 ppb. Table 12 shows that no exceedances of the NO_2 annual or 1-hour NAAQS were recorded at Maricopa County monitoring sites in 2018.

Table 12. 2018 NO_2 1-hour Data Summary

Site Name	NO_2 Maximum (ppb)	NO_2. 98th Percentile (ppb)	NO_2 3-Year Average of the 98th Percentiles (ppb)	NO_2 Annual Average (ppb)
Buckeye	39.0	34.0	32.3	7.67
Central Phoenix	70.0	56.0	59.0	17.53
Diablo	63.0	56.0	56.0	18.93
Thirty-Third	75.0	62.0	64.0	28.25
West Phoenix	57.0	52.0	54.0	16.12

Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Additional information required by EPA for the near-road NO_2 monitors is shown in Table 13. The Arizona Department of Transportation (ADOT) provides the annual average daily traffic (AADT) counts throughout Arizona. The most current estimate for Maricopa County is based on preliminary 2017data from the ADOT interactive web map. The maximum AADT traffic count location is by the I-10, just north of the Broadway Curve, near the SR 143 and US 60 interchange.

Table 13. 2018 NO_2 Data Required by EPA

CBSA	Population & Census Year (2017)	Max AADT Counts (2017)	Required Near-Road Monitors	Active Near-Road Monitors	Additional Near-Road Monitors Needed	Required Area-Wide Monitors	Active Area-Wide Monitors	Additional Area-Wide Monitors Needed
38060	4,307,033	277,118*	2	2	0	1	4	0

* - As per ADOT, the traffic volume data provided above is raw data directly from the counter. The traffic counts have not been seasonally factored and may not reflect the annualized values. The information is provided for general information to the public.

Sources: U.S. Census Bureau: Vintage 2017 Population Estimates
Arizona Department of Transportation: 2017 Average Annual Daily Traffic Report

Ozone (O_3)

Figure 9 shows the seventeen O_3 monitors operating during 2018. The O_3 monitors are designated as SLAMS. The data were reported to AQS, and data are suitable for use with NAAQS comparisons.

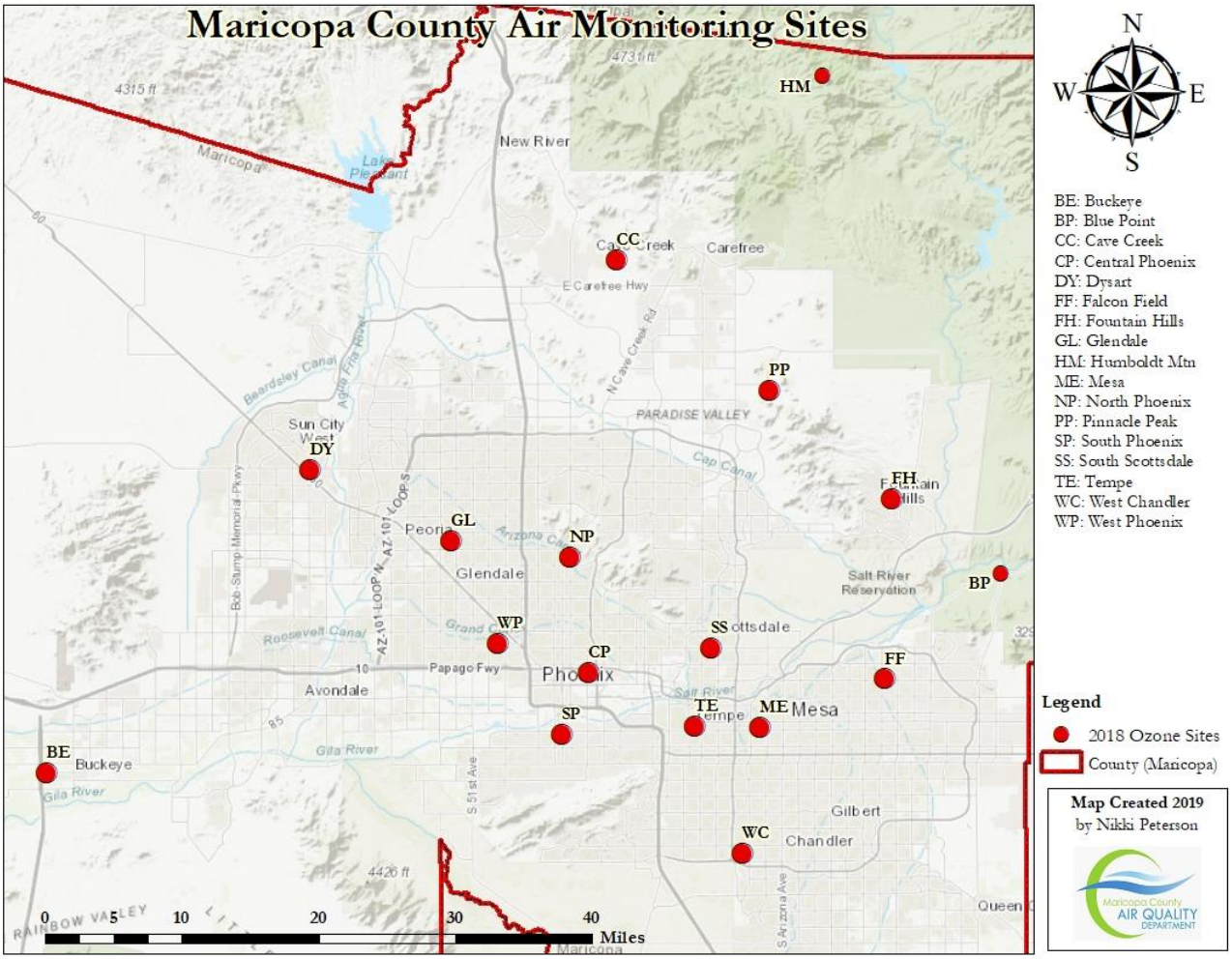


Figure 9. 2018 O_3 Monitoring Site Map

As stated in the O_3 summary, compliance with the NAAQS is determined by averaging the fourth highest 8-hour average over a 3-year period. Currently, this 3-year average must be less than or equal to 0.070 ppm. The 8-hour NAAQS is violated when a 3-year average using the fourth highest concentration measured in each year exceeds 0.070 ppm. In 2018, forty-seven days exceeded the new 2015 8-hour primary standard for O_3, and eleven sites violated the NAAQS. Table 14 presents the 2018 8-hour O_3 data summary from MCAQD monitoring sites.

Table 14. 2018 Eight-hour Average O_3 Data Summary

Site	1st 8-hr Maximum (ppm)	2nd 8-hr Maximum (ppm)	3rd 8-hr Maximum (ppm)	4th 8-hr Maximum (ppm)	Qty. of Days > 0.070 ppm
Blue Point	0.081†	0.081†	0.081†	0.078†	21
Buckeye	0.072†	0.070	0.069	0.069	1
Cave Creek	0.079†	0.075†	0.074†	0.074†	11
Central Phoenix	0.079†	0.075†	0.071†	0.071†	5
Dysart	0.086†	0.085†	0.078†	0.077†	9
Falcon Field	0.082†	0.080†	0.078†	0.076†	22
Fountain Hills	0.084†	0.077†	0.077†	0.076†	14
Glendale	0.077†	0.073†	0.072†	0.070	3
Humboldt Mt.	0.081†	0.078†	0.075†	0.075†	12
Mesa	0.082†	0.081†	0.078†	0.077†	23
North Phoenix	0.085†	0.080†	0.079†	0.076†	14
Pinnacle Peak	0.090†	0.082†	0.081†	0.080†	27
South Phoenix	0.078†	0.076†	0.074†	0.072†	6
South Scottsdale	0.072†	0.072†	0.072†	0.070	3
Tempe	0.071†	0.071†	0.070	0.069	2
West Chandler	0.075†	0.072†	0.069	0.069	2
West Phoenix	0.086†	0.077†	0.077†	0.074†	6

† - Indicates an exceedance of the 2015 8-hr NAAQS

Source: EPA AQS database - *2018 Quicklook Criteria Report (AMP450)*

Table 15 shows additional information required by EPA.

Table 15. 2018 O_3 Data Required by EPA

CBSA		38060
County		Maricopa
Population & Census Year (2017)		4,307,033
3-Year Design Value		0.077 ppm
3-Year Design Value Site(s)	AQS ID	04-013-2005
	Site Name	Pinnacle Peak
	Monitoring Organization	MCAQD
MCAQD 8-Hour Maximum Concentration		0.090 ppm
MCAQD 8-Hour Maximum Concentration Site(s)	AQS ID	04-013-2005
	Site Name	Pinnacle Peak
	Monitoring Organization	MCAQD
MSA Maximum 8-Hour Concentration		0.090 ppm
MSA Maximum Concentration Site(s)	AQS ID	04-013-2005
	Site Name	Pinnacle Peak
	Monitoring Organization	MCAQD
Required Monitors		3
Active Monitors		18
Additional Monitors Needed		0

Sources: EPA AQS database – *2018 Preliminary Design Value Report (AMP480) and 2018 Quicklook Criteria Report (AMP450)*
U.S. Census Bureau: Vintage 2017 Population Estimates

Lead (Pb)

Figure 10 shows the Deer Valley site, which is the only site monitoring for Pb. Two Pb monitors are required at the Deer Valley Airport for QA purposes and both monitors are designated as SLAMS. The data were reported to AQS, and data are suitable for use with NAAQS comparisons.

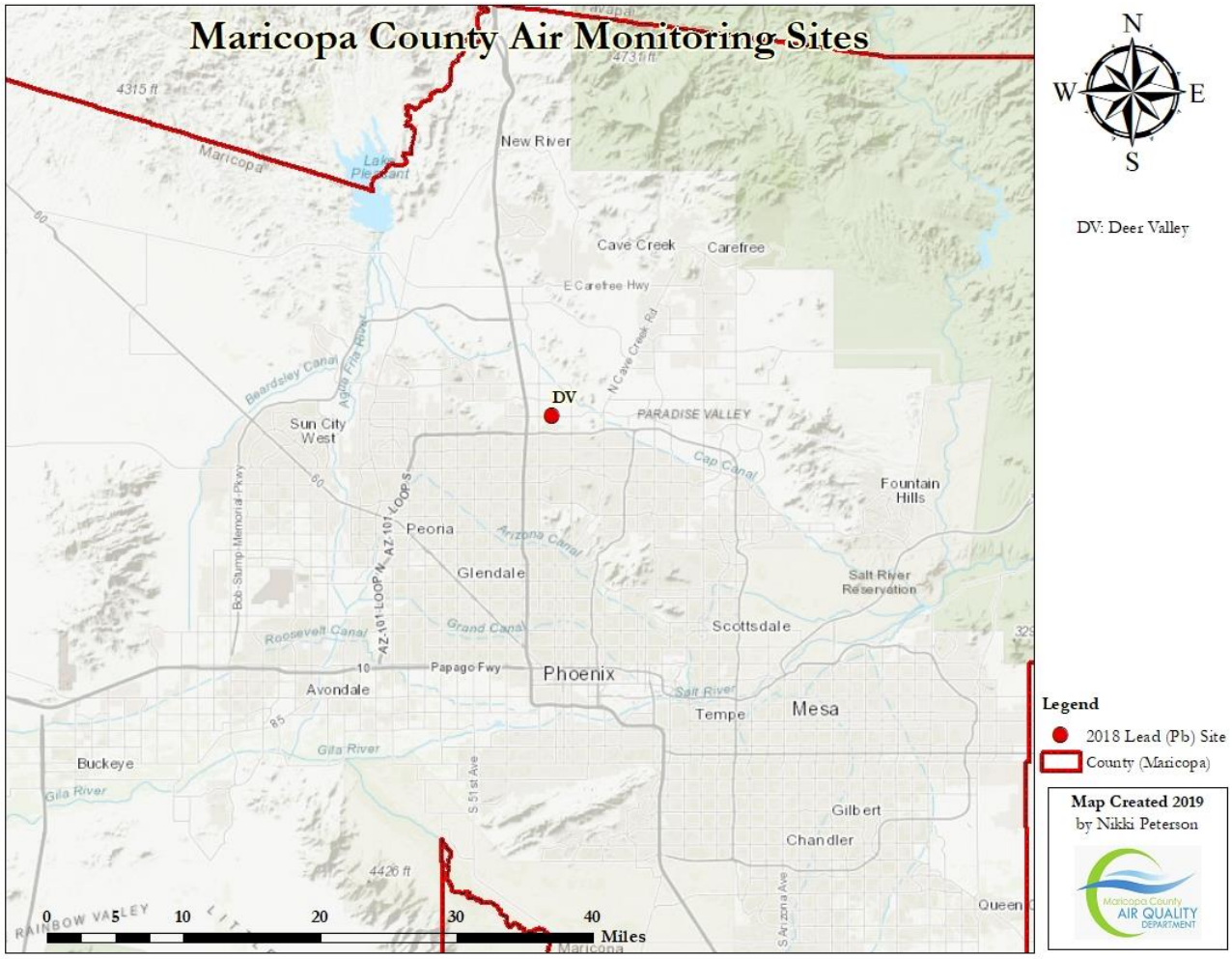


Figure 10. 2018 Pb Monitoring Site Map

In July 2010, this Pb monitoring site opened near the Deer Valley Airport in north Phoenix. This airport is one of the busiest general aviation airports in the region, and it serves a significant number of propeller-driven aircraft, which still use Pb-containing general aviation fuel unlike jet engine-driven aircraft.

The primary and secondary Pb NAAQS levels are identical. Either is violated if a rolling 3-month average exceeds 0.15 $\mu g/m^3$. Table 16 shows a summary of the 2018 Pb data required by EPA.

Table 16. 2018 Pb Data Summary

Site	24-hour Maximum ($\mu g/m^3$)	24-hour 2nd Maximum ($\mu g/m^3$)	Maximum 3-month Rolling Quarterly Average ($\mu g/m^3$)	Number of Samples
Deer Valley	0.099	0.075	0.05	61

Sources: EPA AQS database – *2018 Quicklook Criteria Report (AMP450) and Maximum Values Report (AMP440)*

According to the 2011 EPA's National Emission Inventory, Deer Valley Airport remains the largest point-source of Pb within Maricopa County that triggers the EPA 1.0 ton per year (tpy) threshold for Pb emissions, which are shown on Table 17.

Table 17. 2018 Pb Data Required by EPA

Source Name	Location	2017 Pb Emissions (tpy)	Emissions Source	Maximum 3-Year Design Value ($\mu g/m^3$)	Design Value Date	Required Monitors	Active Monitors	Additional Monitors Needed
Deer Valley Airport	Phoenix, AZ	0.9301	General Aviation Airport	0.05	January 2018	1	1	0

* - based on a 3-month rolling average

Sources: EPA National Emissions Inventory (NEI) database – preliminary data
EPA AQS database -– *2018 Preliminary Design Value Report (AMP480)*

Particulate Matter ≤10 Micrometers (PM_{10})

Figure 11 shows the sixteen PM_{10} monitors operating during 2018. The PM_{10} monitors are designated as SLAMS, and data are suitable for comparison to the NAAQS. All PM_{10} monitoring stations operate continuous PM_{10} analyzers that collect hourly-averaged data. It is worth noting that EPA does not require PM_{10} analyzers to be collocated at the PQAO level or the national level.

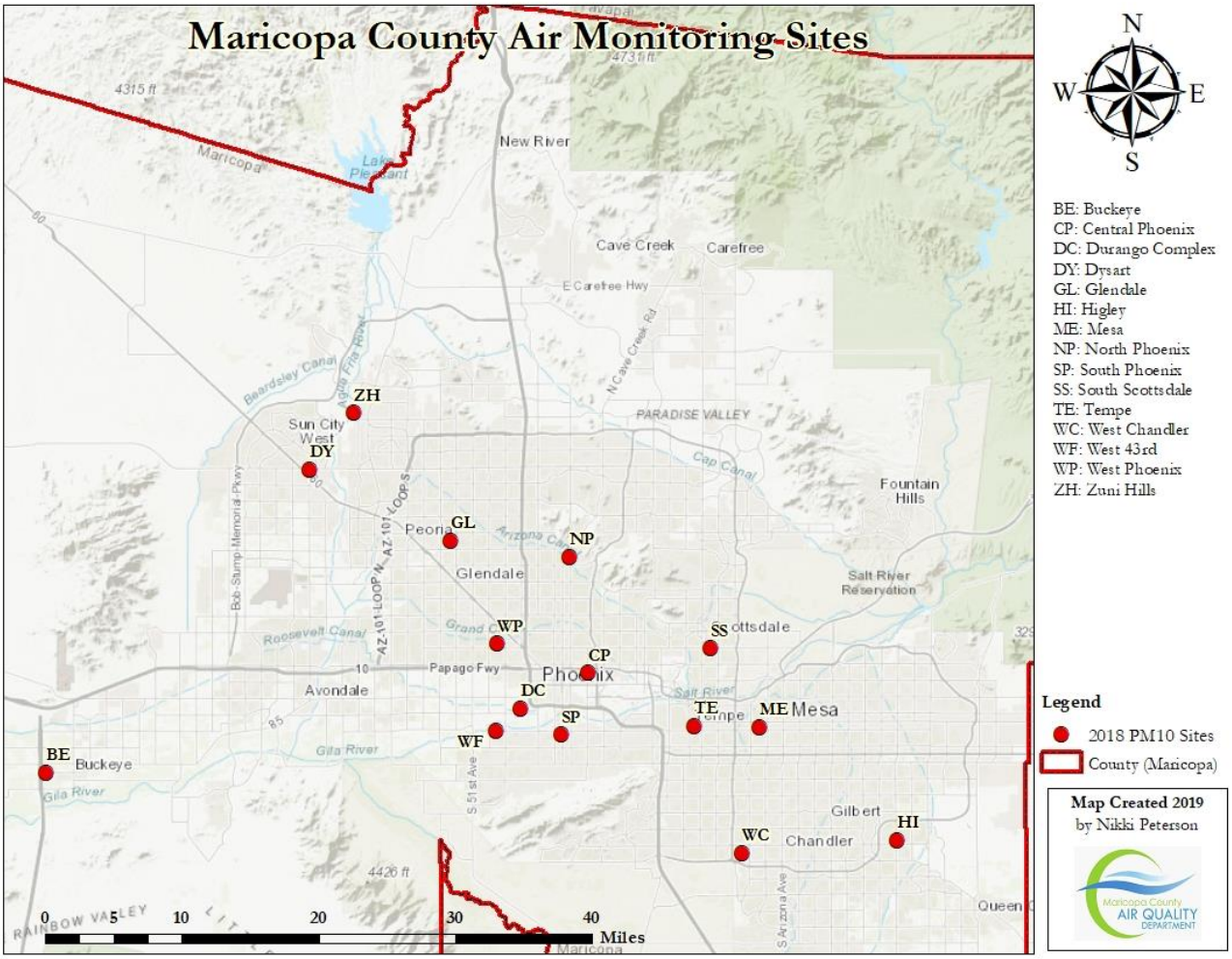


Figure 11. 2018 PM_{10} Monitoring Site Map

The PM_{10} NAAQS are violated when the expected number of exceedances at a monitor is more than one per year on average over three years. The expected number of exceedances for a site is estimated using a formula provided in *40 CFR Part 50 Appendix K*. The formula takes into account the number of days sampling occurs and the number of valid samples that can be collected. A 3-year average of these estimated days is then used to determine compliance. Effective December 18, 2006, EPA revoked the PM_{10} annual primary standard; however, the annual weighted average is displayed for informational purposes (see Table 18).

In recent years, some PM_{10} exceedances occurring in the Maricopa County CBSA have been successfully attributed to an EE. Again, as per the EPA's *EER*, an EE is an uncontrollable event that was caused by natural sources of pollution or an event that is not expected to recur at a given location. ADEQ makes the determination of which events to classify as exceptional; then, they submit documentation to EPA

supporting the contention that the exceedance(s) was due to an EE. If EPA R9 concurs, the PM_{10} concentrations measured during the EE are not used to determine compliance with the NAAQS. The EE counts below are current as of this review's publishing.

In 2018, there were fourteen days that exceeded the 24-hour PM_{10} NAAQS at MCAQD's sites. Table 18 shows the 2018 PM_{10} 24-hour NAAQS status and data summary, including EE data values.

Table 18. 2018 PM_{10} 24-Hour Data Summary Including EE Data

Site Name	Maximum 24-Hour Average ($\mu g/m^3$)	2nd Maximum 24-Hour Average ($\mu g/m^3$)	Number of 24-hour NAAQS Exceedances	Expected Exceedance Rate	Annual Weighted Average ($\mu g/m^3$)	Quantity of EEs
Buckeye	285†‡	161†‡	3	3.044	43.0	3
Central Phoenix	337†‡	294†‡	4	4	39.1	4
Durango Complex	282†‡	188†‡	3	3.067	43.1	3
Dysart	244†‡	164†‡	3	3	30.3	3
Glendale	235†‡	208†‡	2	2.044	23.6	2
Higley	215†‡	196†‡	5	5.101	38.1	5
Mesa	257†‡	235†‡	2	2	24.3	2
North Phoenix	216†‡	166†‡	2	2	21.3*	2
South Phoenix	171†‡	160†‡	2	2	33.8	2
South Scottsdale	341†‡	221†‡	4	4	31.2	4
Tempe	235†‡	168†‡	2	2	26.8	2
West Chandler	382†‡	228†‡	7	7	35.1	7
West 43rd Avenue	385†‡	275†‡	8	8	60.4	8
West Phoenix	259†‡	237†‡	4	4	33.3	4
Zuni Hills	231†‡	156†‡	2	2.165	27.8	2

† - Indicates an exceedance of the standard
‡ - Data are associated with exceptional event flag
* - Indicates that the mean does not satisfy summary criteria, e.g. data completeness

Sources: EPA AQS database - *2018 Quicklook Criteria Report (AMP450) and the 2018 Maximum Values Report (AMP440)*

Table 19 shows additional information required by EPA. Data include measurements submitted as EEs.

Table 19. 2018 PM_{10} Data Required by EPA

CBSA		38060
County		Maricopa
Population & Census Year (2017)		4,307,033
MCAQD Maximum 24-Hour Concentration		385 µg/m^3
MCAQD Maximum Concentration for Site	AQS ID	04-013-4009
	Site Name	West 43rd
MSA Maximum 24-Hour Concentration		1100 µg/m^3
MSA Maximum Concentration Site	AQS ID	04-021-3008
	Site Name	Stanfield
	Monitoring Organization	PCAQCD
Required Monitors		6-10
Active Monitors		16
Additional Monitors Needed		0

Sources: EPA AQS database - *2018 Quicklook Criteria Report (AMP450)*
U.S. Census Bureau: Vintage 2017 Population Estimates

Particulate Matter ≤2.5 Micrometers ($PM_{2.5}$)

Figure 12 shows the eight $PM_{2.5}$ sites operating during 2018. All $PM_{2.5}$ monitors are designated as SLAMS. Data were reported to AQS, and data are suitable for comparison to the NAAQS.

The $PM_{2.5}$ monitoring network is representative of "area-wide" air quality in respect to fine particulate with the exception of the monitor at Diablo, which is a "near-road" monitoring site. At Diablo, the $PM_{2.5}$ monitor collects source-oriented emissions from vehicular traffic and represents the microscale.

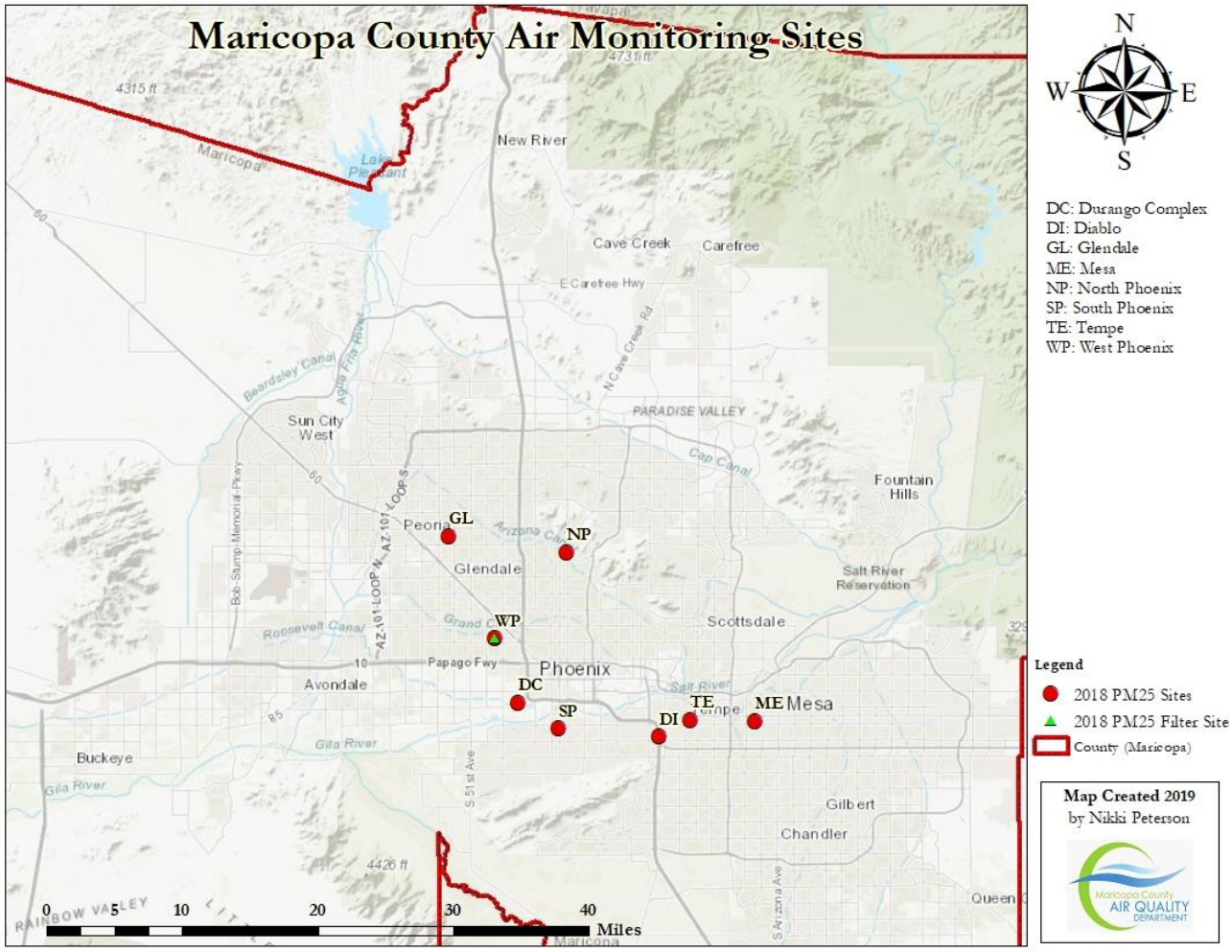


Figure 12. 2018 $PM_{2.5}$ Monitoring Site Map

Each $PM_{2.5}$ site operates a continuous FEM monitor that provides hourly concentration data used for NAAQS comparison. The West Phoenix site remains our "collocated" site for $PM_{2.5}$, which means that we operate one FEM continuous analyzer designated as the "primary monitor" and one FRM filter-based $PM_{2.5}$ sampler designated as the "secondary monitor". The FRM sampler collects a filter sample every 12 days for QA purposes. The secondary monitor is required to meet the EPA's QA collocation requirements for the $PM_{2.5}$ network.

The EPA may reference data from the secondary monitor to better evaluate air quality in the area. In addition to the secondary monitor's data being used for QA purposes, if necessary, the data can be substituted for the primary monitor's data as per *40 CFR Part 50 Appendix N*. This secondary monitor

collects a 24-hour filter sample from midnight-to-midnight on the designated 1:12 day schedule as required for collocated QA samples. The EPA OAQPS produces the annual sampling calendar each year and posts it on the AMTIC website.

Maricopa County is currently in attainment for $PM_{2.5}$. The MCAQD continually assesses the existing network to ensure it adequately represents air quality in Maricopa County with regard to $PM_{2.5}$. To determine compliance with the annual $PM_{2.5}$ NAAQS requires that three years of the annual average of 24-hour data be used from each monitor. To determine compliance with the 24-hour NAAQS requires that three years of the 98th percentile data be used from each $PM_{2.5}$ monitor. For data to be acceptable for comparison to the annual and the 24-hour NAAQS, a site's $PM_{2.5}$ monitor must meet all EPA-required operating and QA criteria.

Required General Statement Regarding Changes to the $PM_{2.5}$ Network

In the event the department needed to move or change a violating $PM_{2.5}$ monitor, this procedure would be followed. The department would hold a public hearing regarding the requested change. Details and documentation of the requested change, as well as all public comments, would then be forwarded to the EPA R9 for approval. Any action on the department's part will be dependent on EPA R9 approval. Please note that this statement is general in nature and required in this AMNP by *40 CFR Part 58*. The department does not currently have any violating $PM_{2.5}$ monitors, nor does it have any proposals to move any $PM_{2.5}$ monitors.

2018 $PM_{2.5}$ Data Summary

In 2018, there were eight exceedances of the 24-hour $PM_{2.5}$ NAAQS at MCAQD's sites. Table 20 summarizes the 2018 24-hour and annual data from the primary monitors only, including EE data values.

Table 20. 2018 $PM_{2.5}$ 24-Hour and Annual Averages

Site Name	Maximum 24-Hour Average Concentration ($\mu g/m^3$)	2nd Maximum 24-Hour Average Concentration ($\mu g/m^3$)	98th Percentile 24-Hour Average Concentration ($\mu g/m^3$)	Annual Average Concentration ($\mu g/m^3$)
Diablo	49.0†‡	43.3†‡	21.9	8.62
Durango Complex	115.3†‡	32.7	25.7	10.10
Glendale	53.2†‡	29.6	19.5	7.33
Mesa	41.1†‡	37.2†‡	19.1	7.42
North Phoenix	45.2†‡	35.6†‡	18.7	7.35*
South Phoenix	134.1†‡	47.6†	27.8	9.37
Tempe	38.2†‡	22.8	16.3	7.11
West Phoenix	199.3†‡	42.6†	30.6	9.92

† - Indicates an exceedance of the standard.
‡ - Data are associated with exceptional event flag
* - Indicates that the mean does not satisfy summary criteria, e.g. data completeness

Source: EPA AQS database – *2018 Quicklook Criteria Report (AMP450)*

The Annual $PM_{2.5}$ NAAQS Status

Compliance with the primary and secondary annual NAAQS is determined by averaging three consecutive years of a site's annual mean value using the 24-hour, or daily, concentrations. The annual $PM_{2.5}$ NAAQS is met when the 3-year annual average concentration is less than or equal to 12.0 $\mu g/m^3$ at each eligible monitoring site. All 3-year averages were below the $PM_{2.5}$ annual NAAQS. Table 21 summarizes the 3-year annual average data.

Table 21. $PM_{2.5}$ 3-Year Annual Averages

Site Name	2016 Annual Average Concentration ($\mu g/m^3$)	2017 Annual Average Concentration ($\mu g/m^3$)	2018 Annual Average Concentration ($\mu g/m^3$)	3-Year Annual Average Concentration ($\mu g/m^3$)
Diablo	7.89	8.07	8.62	8.19
Durango Complex	9.48	10.25	10.10	9.94
Glendale	6.75	6.69	7.33	6.92
Mesa	6.75	8.13	7.42	7.43
North Phoenix	6.47	7.46	7.35*	7.09*
South Phoenix	8.45	9.00	9.37	8.94
Tempe	6.84	7.10	7.11	7.01
West Phoenix	8.78	9.56	9.92	9.42

* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness

Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

2018 24-Hour $PM_{2.5}$ NAAQS Status

Compliance with the primary and secondary 24-hour $PM_{2.5}$ NAAQS is determined by averaging 3-consecutive years of the 24-hour 98th percentile concentration values from all eligible sites. The 24-hour NAAQS is met when 3-year average concentration values is less than or equal to 35 µg/m^3. In 2018, there were eight exceedance days, but no violations of the primary or secondary 24-hour NAAQS occurred. Table 22 summaries the 3-year 24-hour 98th percentile data from the FEM analyzers.

Table 22. $PM_{2.5}$ 3-Year 24-Hour Averages of the 98th Percentile

Site Name	2016 98th Percentile 24-Hour Average Concentration (µg/m^3)	2017 98th Percentile 24-Hour Average Concentration (µg/m^3)	2018 98th Percentile 24-Hour Average Concentration (µg/m^3)	3-Year 98th Percentile 24-Hour Average Concentration (µg/m^3)
Diablo	16.6	21.3	21.9	19.93
Durango Complex	22.7	30.6	25.7	26.33
Glendale	17.7	16.7	19.5	17.96
Mesa	14.0	19.0	19.1	17.36
North Phoenix	16.3	18.9	18.7	17.96
South Phoenix	22.8	25.0	27.8	25.2
Tempe	14.9	16.2	16.3	15.8
West Phoenix	23.8	30.2	30.6	28.2

* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness

Source: EPA AQS database – *2016 - 2018 Quicklook Criteria Report (AMP450)*

Table 23 shows additional information required by EPA. The $PM_{2.5}$ annual and daily design values include any measurements submitted as an EE for EPA's concurrence. In 2018, there were no EEs submitted for $PM_{2.5}$ exceedances. Maricopa County operates more than the required minimum number of $PM_{2.5}$ monitors for the CBSA.

Table 23. 2018 $PM_{2.5}$ Data Required by EPA

CBSA		38060
County		Maricopa
Population & Census Year (2017)		4,307,033
MCAQD Annual Design Value		9.9 µg/m³
MCAQD Annual Design Value Site	AQS ID	04-013-9812
	Site Name	Durango Complex
MCAQD 24-Hour Design Value		28.0 µg/m³
MCAQD 24-Hour Design Value Sites	AQS ID	04-013-0019
	Site Name	West Phoenix
MCAQD Max 24-Hour Concentration		199.3 µg/m³
MCAQD Max Concentration for Site	AQS ID	04-013-0019
	Site Name	West Phoenix
MSA Max 24-Hour Concentration		36.0 µg/m³
MSA Max Concentration Site	AQS ID	04-021-3015
	Site Name	Hidden Valley
	Monitoring Organization	PCAQCD
Required Monitors		3
Active Monitors		8
Additional Monitors Needed		0

Sources: EPA AQS database - *2018 Preliminary Design Value Report (AMP480) and 2018 Quicklook Criteria Parameter Report (AMP450)*
U.S. Census Bureau: Vintage 2017 Population Estimates

Sulfur Dioxide (SO_2)

Figure 13 shows the two SO_2 SLAMS monitors operating in 2018. The data were reported to AQS, and the data are suitable for NAAQS comparison.

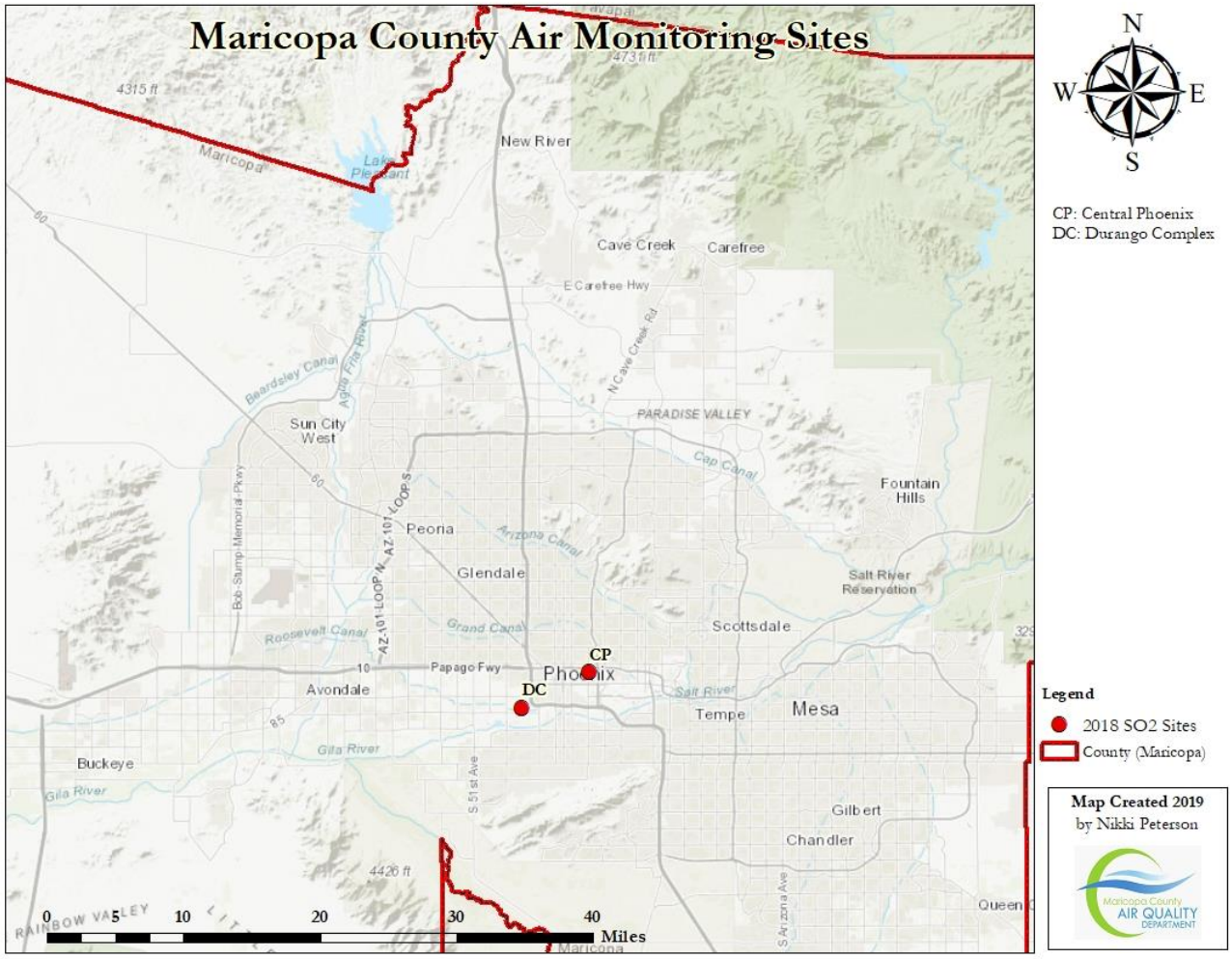


Figure 13. 2018 SO_2 Monitoring Site Map

Sulfur dioxide has a 1-hour primary standard and a 3-hour secondary standard. The 24-hour and annual average standards were revoked in a June 2010 rulemaking. A violation of the primary standard occurs when the 3-year average of the 99th percentile of the daily maximum 1-hour average exceeds 75 ppb. A violation of the secondary standard occurs when a 3-hour average of 500 ppb is exceeded more than once per year. Maricopa County is in attainment for SO_2.

For calendar year 2018, no exceedances of the SO_2 primary 1-hour or secondary 3-hour standard were recorded at Maricopa County monitoring sites. The EPA now requires that the highest 5-minute average per hour per day be reported to AQS; however, there is not a 5-minute SO_2 NAAQS level. The EPA no longer requires the reporting of 3-hour values for the SO_2 secondary NAAQS. Table 24 shows the 2018 SO_2 data summary.

Table 24. 2018 SO_2 Data Summary

Site	1-hour Maximum Concentration (ppb)	1-hour 2nd Maximum Concentration (ppb)	1-hour 99th Percentile (ppb)
Central Phoenix	10.0	9.0	8.0
Durango Complex	10.0	10.0	8.0

Source: EPA AQS database – *2018 Quicklook Criteria Parameters Report (AMP450)*

The minimum required quantity of SO_2 monitors operating within the MCAQD's network is based on either the Population Weighted Emissions Index (PWEI) and/or the EPA R9 Administrator's input (see *40 CFR Part 58 - Appendix D 4.4.3)*. The below was the most current information found online for SO_2 emissions, we will continue to update as newer data is available.

Table 25 shows additional information required by EPA.

Table 25. 2018 SO_2 Data Required by EPA

CBSA	County	Population & Census Year (2017)	Total SO_2 Emitted (2014) (tpy)	Population Weighted Emission Index	Required Monitors	Active Monitors	Additional Monitors Needed
38060	Maricopa	4,307,033	1177	4025	0	2	0

Sources: The EPA's National Emissions Inventories (NEI) database – 2014 NEI Data
U.S. Census Bureau: Vintage 2017 Population Estimates

Summary of 2018 Criteria Pollutant NAAQS Status

This section summarizes information regarding the status of each pollutant relative to its NAAQS level. It also provides detailed information regarding pollutants that are in NAAQS violation. Table 26 summarizes the 2018 NAAQS exceedances and violations by pollutant.

Table 26. 2018 NAAQS Exceedances and Violation Summary

Pollutant	NAAQS Status
CO	No exceedances or violations of the 1-hour or 8-hour primary 2011 NAAQS occurred.
NO_2	No exceedances or violations of the 1-hour or annual primary 2010 NAAQS or annual secondary 2012 NAAQS occurred.
O_3	On forty-seven unique days, at least one monitor exceeded the 2015 8-hour primary / secondary NAAQS. Eleven violations of the 2015 8-hour primary / secondary NAAQS occurred.
Pb	No exceedances or violations of the 3-month primary / secondary 2008 NAAQS occurred.
PM_{10}	On fourteen unique days, at least one monitor exceeded the 24-hour primary / secondary 1987 NAAQS, but no sites violated the primary / secondary 1987 NAAQS.
$PM_{2.5}$	On eight unique days, at least one monitor exceeded the 2012 24-hour primary / secondary NAAQS, but no sites violated the 24-hour or annual primary / secondary 2012 NAAQS.
SO_2	No exceedances or violations of the primary annual or 1-hour 2010 NAAQS or the annual secondary 2010 NAAQS occurred.

2018 O_3 Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the O_3 network in 2018 and the 2015 NAAQS violation status based upon years 2016 - 2018.

O_3 NAAQS Exceedances

The 2015 O_3 NAAQS level of 0.070 ppm is exceeded when a rolling 8-hour average is 0.071 ppm or higher. Figure 14 shows the O_3 2018 exceedance dates and concentrations by site for the 2015 NAAQS.

Ozone Exceedance Days 2018

as of 09/09/2018

Ozone 8-Hr Avg. NAAQS > 0.070 ppm

	Buckeye	Blue Point	Cave Creek	Central Phoenix	Dysart	Falcon Field	Fountain Hills	Glendale	Humboldt Mt.	Mesa	North Phoenix	Pinnacle Peak	South Phoenix	South Scotts.	Tempe	West Chandler	West Phoenix
04/17/18		0.071															
04/18/18	0.072	0.071	0.075		0.075				0.078			0.073					
04/23/18		0.073				0.073				0.074		0.072					
04/24/18		0.078	0.071			0.073	0.071		0.073	0.071		0.075					
04/25/18		0.075	0.071			0.073			0.072	0.073	0.071	0.073					
04/26/18		0.073															
05/07/18										0.076							
05/08/18												0.072					
05/09/18		0.076	0.071			0.074	0.071			0.072		0.074	0.072				0.071
05/18/18									0.071								
05/19/18									0.072			0.073					
05/29/18		0.073				0.071						0.076					
06/01/18						0.071											
06/02/18		0.071	0.072			0.071				0.073	0.076	0.074					
06/03/18						0.073				0.073							
06/04/18				0.071							0.074	0.076	0.072				
06/20/18		0.081	0.074			0.078	0.077		0.071	0.076	0.071	0.081					
06/21/18		0.074					0.071					0.073					
06/22/18												0.071					
06/25/18		0.071				0.071	0.072					0.073					
06/28/18		0.073															
07/08/18				0.071						0.073	0.072						
07/09/18										0.072	0.071	0.071					
07/10/18					0.072												
07/11/18					0.071						0.071						
07/12/18												0.072					
07/16/18										0.078							
07/17/18		0.073	0.074	0.079	0.086	0.076	0.076	0.077	0.071	0.077	0.085	0.076	0.076	0.072	0.071		0.086
07/20/18						0.071											
07/23/18		0.075				0.073	0.071				0.071	0.078					
07/24/18		0.075	0.071			0.072	0.071					0.078					
07/25/18												0.071					
07/26/18									0.072								
07/27/18												0.077					
07/28/18		0.071				0.076	0.073			0.077		0.075					
07/31/18		0.071	0.074		0.085		0.071	0.072	0.081	0.073	0.080	0.080	0.071				0.077
08/01/18		0.081				0.080	0.077		0.072	0.077		0.082		0.072			
08/02/18		0.081	0.079	0.071	0.078	0.082	0.084	0.073	*	0.082	0.079	0.090	0.074	0.072		0.075	0.074
08/03/18		0.073			0.071	0.075	0.075			0.074	0.075	0.077					
08/06/18						0.072				0.074		0.071					
08/09/18						0.075				0.075							
08/10/18						0.072	0.071			0.076							
08/11/18			0.071	0.075	0.077	0.072			0.075	0.081			0.078		0.071	0.072	0.077
08/12/18										0.071							
08/15/18									0.072		0.071						
08/31/18										0.071							
09/07/18					0.072						0.072						0.071
Exceedance Days	1	21	11	5	9	22	14	3	12	23	14	27	6	3	2	2	6
Maximum Value	0.072	0.081	0.079	0.079	0.086	0.082	0.084	0.077	0.081	0.082	0.085	0.090	0.078	0.072	0.071	0.075	0.086
4th High Value >0.070		0.078	0.074	0.071	0.077	0.076	0.076		0.073	0.077	0.076	0.08	0.072				0.074

All sites are located in or near the Ozone Nonattainment Area
Please see ADEQ for information on additional statewide ozone sites

Total Number of Days where at least one monitor exceeded the 47

NOTE: Regarding HM on 08/01/18 - The maximum 8-hour value of 0.075 ppm at HM was recorded at midnight and does not exceed the 2015 NAAQS. If the value had been ≥ 0.076 ppm, the 2008 NAAQS would have been exceeded. However, the second maximum value of 0.072 ppm recorded at 20:00 does count as an exceedance of the 2015 NAAQS as per 40 CFR Part 50 Appendix U, section 3 (c).

* - The maximum 8-hour value of 0.071 ppm at HM on 08/02/18 was recorded at midnight and does not exceed the 2015 NAAQS as per 40 CFR Part 50 Appendix U, section 3 (c). If the value had been ≥ 0.076 ppm, the 2008 NAAQS would have been exceeded.

Figure 14. 2018 O_3 Exceedances

Sources: EPA AQS database – *2018 PM_{10} Maximum Values (AMP440) and 2018 Raw Data NAAQS Averages (AMP350NW) Reports*

O_3 NAAQS Violation Status - Including Exceptional Event Data

A site violates the 2015 O_3 NAAQS when its 3-year average of the 4th highest rolling 8-hour average concentration measured during a year exceeds 0.070 ppm. This section shows the sites that violate the 2015 O_3 NAAQS, and it includes the data associated with the 2017 EE submittal. Figure 15 shows a graph of the sites that violated the 2015 O_3 NAAQS in 2018. If the EPA does not concur with the EE demonstration package submitted for July 7, 2017, then, eleven sites within the MCAQD network will violate the O_3 NAAQS. The sites that violated in 2018 are: BP, CC, CP, DY, FF, FH, HM, ME, NP, PP, and WP.

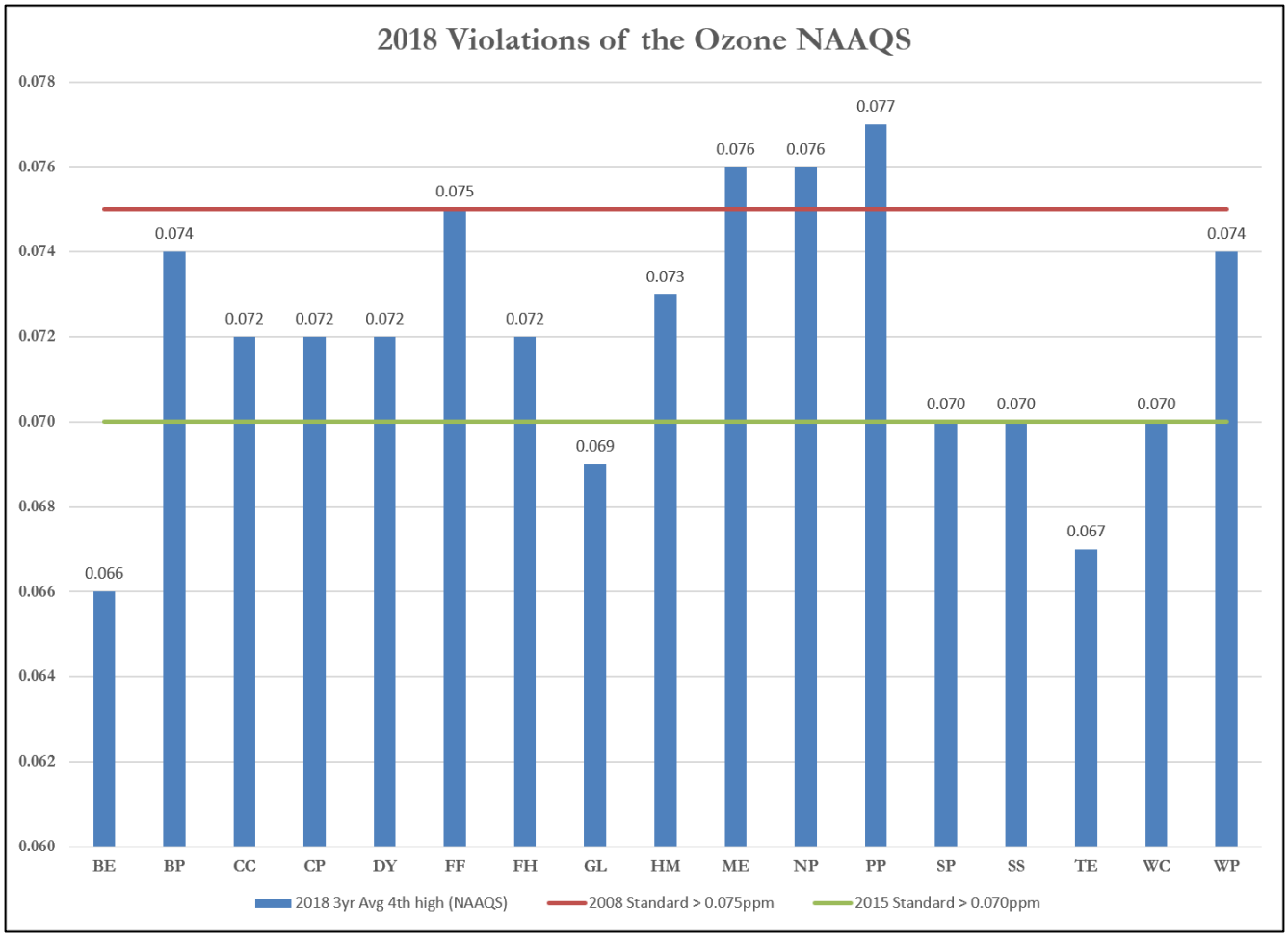


Figure 15. 2018 O_3 Violations of the 2015 NAAQS

O_3 Exceptional Events and Status of EPA Concurrence

There were no EE packages submitted for O_3 exceedances that occurred in 2016 or 2018. There was an EE demonstration package submitted to EPA for the exceedance day of July 7, 2017. The EPA has yet to concur or not with the EE demonstration package before O_3 data can be omitted from NAAQS comparisons. The concentrations include hourly O_3 data that are flagged as an EE with the qualifier code indicated.

2018 PM_{10} Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the PM_{10} networks in 2018 and NAAQS violation status based upon years 2016 - 2018.

PM_{10} NAAQS Exceedances

A PM_{10} exceedance occurs when a monitor's 24-hour average concentration from midnight-to-midnight is 155.5 µg/m^3 or higher. Figure 16 shows the site and date of PM_{10} exceedances that occurred in 2018. All 2018 exceedances of the PM_{10} NAAQS qualify for EE consideration and demonstration packages will be developed for EPA's review. The 24-hour concentrations shown below include hourly PM_{10} data flagged as an EE.

2018 Exceedance Days of the 24-Hr PM_{10} NAAQS

PM_{10} 24-Hr Avg. NAAQS ≥ 155 µg/m^3

	Buckeye	Central Phoenix	Durango Complex	Dysart	Glendale	Higley	Mesa	North Phoenix	South Phoenix	South Scottsdale	Tempe	West Chandler	West 43rd	West Phoenix	Zuni Hills
01/01/2018									171					237	
01/09/2018												228	176		
04/12/2018	161		176			188			160			171	385		
04/19/2018													174		
05/11/2018						215									
07/08/2018		287	282	159	208	177				187		382	273	259	
07/09/2018		337		244	235	195	235	216		341	168	161	275	167	231
07/21/2018		215	188					166						169	
07/30/2018				164									197		156
08/02/2018	285						257					193			
08/07/2018	158	294				196						197	197		
08/08/2018										221	235	156			
08/12/2018													167		
08/20/2018										187					
Exceedance Days	3	4	3	3	2	5	2	2	2	4	2	7	8	4	2

NOTE: 2018 exceedances qualifying for an EE sumbittal to EPA are shown in RED

Number of Days in 2018 where at least one monitor exceeded the 14

Figure 16. 2018 PM_{10} Exceedances

Source: EPA AQS database – *2018 PM_{10} Maximum Values Report (AMP440)*

PM_{10} Exceptional Events and Status of EPA Concurrence

The EPA has yet to concur or not with EE demonstration package submittals for 2016, 2017, and 2018. Table 27 shows the EE qualifier associated with each exceedance. Please note that data holding EE concurrence from EPA are not included when determining compliance with the NAAQS. This following information contrasts the PM_{10} NAAQS violation status with and without EPA concurrence.

Table 27. 2018 PM_{10} Exceptional Event Information

PM_{10} Exceedance Date	Site	24-Hour Average Concentration (µg/m³)	EE Qualifier Code	Qualifier Code Description
01/01/18	SP	171	rh	fireworks
	WP	237		
01/09/18	WC	228	rj	high winds
	WF	176		
04/12/18	BE	161	rj	high winds
	DC	176		
	HI	188		
	SP	160		
	WC	171		
	WF	385		
04/19/18	WF	174	rj	high winds
05/11/18	HI	215	rj	high winds
07/08/18	CP	287	rj	high winds
	DC	282		
	DY	159		
	GL	208		
	HI	177		
	SS	187		
	WC	382		
	WF	273		
	WP	259		
07/09/18	CP	337	rj	high winds
	DY	244		
	GL	235		
	HI	195		
	ME	235		
	NP	216		
	SS	341		
	TE	168		
	WC	161		
	WF	275		
	WP	167		
	ZH	231		
07/21/18	CP	215	rj	high winds
	DC	188		
	NP	166		
	WP	169		
07/30/18	DY	164	rj	high winds
	WF	197		
	ZH	156		
08/02/18	BE	285	rj	high winds
	ME	257		
	WC	193		
08/07/18	BE	158	rj	high winds
	CP	294		
	HI	196		
	WC	197		
	WF	197		
08/08/18	SS	221	rj	high winds
	TE	235		
	WC	156		
08/12/18	WF	167	rj	high winds
08/20/18	SS	187	rj	high winds

Source: EPA AQS database – *2018 PM_{10} Maximum Values Report (AMP440)*

PM_{10} 24-Hour NAAQS Violation Status - Including Exceptional Event Data

As per *40 CFR Part 50.6 (a)*, a site violates the primary and/or secondary 24-hour PM_{10} NAAQS when the calculated "rate of expected exceedances" is greater than one (> 1) when averaged over three consecutive years. Table 28 includes EE data and shows the maximum three-year 24-hour PM_{10} averages, the calculation of expected exceedances for each year, and the calculation of three-year average for the rate of expected exceedances. If the EPA does not concur with the EE demonstration packages submitted for years 2016 through 2018, then, ten sites within the MCAQD network will violate the PM_{10} NAAQS as shown in the 3-Year Average Rate of Expected Exceedance column.

Table 28. 2018 Violations of the PM_{10} 24-Hour NAAQS Including EE Data

Site	2016		2017		2018		3-Year Average Rate of Expected Exceedances
	24-Hour Maximum (µg/m³)	Expected Exceedances	24-Hour Maximum (µg/m³)	Expected Exceedances	24-Hour Maximum (µg/m³)	Expected Exceedances	
Buckeye	153	0	177‡	2	285‡	3.044	1.68
Central Phoenix	106	0	158‡	1	337‡	4	1.66
Durango Complex	112	0	170‡	3.067	282‡	3.067	2.04
Dysart	173‡	1	168‡	1.122	244‡	3	1.70
Glendale	180‡	2.022	136	0	235‡	2.044	1.35
Higley	Not Operating	Not Available	147	0	215‡	5.101	Not Available
Mesa	100	0	141	0	257‡	2	0.66
North Phoenix	141	0	122	0	216‡	2	0.66
South Phoenix	130	0	129	0	171‡	2	0.66
South Scottsdale	115	0	170‡	1	341‡	4	1.66
Tempe	77	0	124	0	235‡	2	0.66
West Chandler	134	0	250‡	1	382‡	7	2.66
West 43rd	174‡	1	164‡	2	385‡	8	3.66
West Phoenix	172‡	1	119	0	259‡	4	1.66
Zuni Hills	174‡	1.011	166‡	1	231‡	2.165	1.39

‡ - MCAQD flagged this exceedance as an EE in AQS

Source: EPA AQS database - *2016 - 2018 – Quicklook Criteria Parameters Report (AMP450)*

PM_{10} 24-Hour NAAQS Violation Status - Excluding Exceptional Event Data

The ADEQ will submit EE packages to EPA R9 for the PM_{10} exceedance days that occurred in 2018. If the EPA concurs with the EE demonstration packages submitted for 2016 through 2018, then, no sites will violate the PM_{10} NAAQS in 2018. Table 29 excludes PM_{10} data considered the result of an EE, regardless of the EPA's concurrence status. If the EPA concurs with the EE demonstration submittals, then no sites will be in violation of the NAAQS as shown on Table 29 in the 3-Year Average Rate of Expected Exceedance column. The 3-year average is one; this is due to three exceedance days in 2017 not qualifying for EE provisions.

Table 29. 2018 Violations of the PM_{10} NAAQS Excluding Data Flagged as an EE

Site	2016		2017		2018		3-Year Average Rate of Expected Exceedances
	24-hour Maximum ($\mu g/m^3$)	Expected Exceedances	24-hour Maximum ($\mu g/m^3$)	Expected Exceedances	24-hour Maximum ($\mu g/m^3$)	Expected Exceedances	
Buckeye	153	0	150	0	126	0	0
Central Phoenix	106	0	126	0	146	0	0
Durango Complex	112	0	170†	3	154	0	1
Dysart	126	0	125	0	120	0	0
Glendale	131	0	136	0	109	0	0
Higley	Not Operating	Not Available	147	0	153	0	Not Available
Mesa	100	0	141	0	154	0	0
North Phoenix	141	0	122	0	147	0	0
South Phoenix	130	0	129	0	96	0	0
South Scottsdale	115	0	129	0	141	0	0
Tempe	77	0	124	0	151	0	0
West Chandler	134	0	134	0	131	0	0
West 43rd Avenue	127	0	160†	1	153	0	0.33
West Phoenix	138	0	119	0	122	0	0
Zuni Hills	140	0	123	0	138	0	0

† - The exceedance is not flagged as an EE

Source: EPA AQS database – *2016 - 2018 Maximum Values Report (AMP440)*

2018 $PM_{2.5}$ Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the $PM_{2.5}$ network in 2018. It includes NAAQS exceedance information and violation status for 2018.

$PM_{2.5}$ Annual NAAQS Exceedance and Violation Status

The annual primary NAAQS for $PM_{2.5}$ is 12.0 µg/m^{3}and the secondary NAAQS for $PM_{2.5}$ is 15.0 µg/m^3. In 2018, there were no violations of either annual NAAQS levels. Each site's annual $PM_{2.5}$ average was shown previously on Table 21. The site with the highest 3-year annual average was Durango Complex with 9.94 µg/m^3.

$PM_{2.5}$ 24-Hour NAAQS Exceedance and Violation Status

The 24-hour primary and secondary NAAQS levels for $PM_{2.5}$ are 35 µg/m^3. If the 24-hour block-average concentration from midnight-to-midnight at a site is 35.5 µg/m^3 or higher, then it is counted as an exceedance. If the 24-hour 3-year average of the 98th percentile exceeds 35 µg/m^3, then the 24-hour NAAQS is violated. Figure 17 shows there were eight exceedance days in 2018 for $PM_{2.5}$; but no sites violated the 2012 NAAQS. Four exceedance days in 2018 qualified for an EE submittal packages.

2018 Exceedance Days of the 24-Hr $PM_{2.5}$ NAAQS

$PM_{2.5}$ 24-Hr Avg. NAAQS ≥ 35.5 µg/m^3

	Diablo	Durango Complex	Glendale	Mesa	North Phoenix	South Phoenix	Tempe	West Phoenix
01/01/2018	49.0	115.3	53.2	41.1	45.2	134.1	38.2	199.3
07/09/2018				37.2	35.6			
08/02/2018				35.6				
08/08/2018	43.3							
11/22/2018						38.1		
12/09/2018								38.1
12/24/2018						45.7		42.6
12/25/2018						47.6		
Exceedance Days	2	1	1	3	2	4	1	3

NOTE: 2018 exceedances qualifying for an EE sumbittal to EPA are shown in RED

Number of Days in 2018 where at least one monitor exceeded the 24-Hr $PM_{2.5}$ NAAQS 8

Figure 17. 2018 $PM_{2.5}$ Exceedances

Source: EPA AQS database – *2018 $PM_{2.5}$ Maximum Values Report (AMP440)*

$PM_{2.5}$ Exceptional Events and Status of EPA Concurrence

There were no $PM_{2.5}$ EEs for years 2016 and 2017. The EPA has yet to concur or not with EE demonstration package submittals for $PM_{2.5}$ exceedances in 2018. Table 30 shows the EE qualifier associated with each qualifying exceedance. Please note that data holding EE concurrence from EPA are not included when determining compliance with the NAAQS.

The EPA has yet to concur or not with the 2018 EE package submittals. Even if the EPA does not concur with the EE demonstration packages for 2018, Maricopa County is in attainment for the $PM_{2.5}$ 2012 NAAQS.

Table 30. 2018 PM_{25} Exceptional Event Information

Date	Site	24-Hour. Average Concentration ($\mu g/m^3$)	EE Qualifier Code	Qualifier Code Description
01/01/18	DI	49.0	rh	fireworks
	DC	115.3		
	GL	53.2		
	ME	41.1		
	NP	45.2		
	SP	134.1		
	TE	38.2		
	WP	199.3		
07/09/18	ME	37.2	rj	high winds
	NP	35.6		
08/02/18	ME	35.6		
08/08/18	DI	43.3		
11/22/18	SP	38.1	not applicable	not applicable
12/09/18	WP	38.1		
12/24/18	SP	45.7		
	WP	42.6		
12/25/18	SP	47.6		

Source: EPA AQS database – *2018 $PM_{2.5}$ Maximum Values Report (AMP440)*

NETWORK MODIFICATION PROCESS

This section reports on the network modifications made in the prior year as well as any future network modifications the MCAQD would like to make or must make for various reasons. The final draft of the AMNP includes these proposed changes, which is available for review and discussion during the 30-day public comment period and the open forum meeting.

Most modifications will require prior approval by EPA R9. The MCAQD's AMD strives to provide the most reliable and relevant air monitoring data to the public. Air quality issues are diverse and are of great interest to the citizens of Maricopa County. High-quality data are a cornerstone of developing and implementing effective SIPs, EE packages, and permits for new and existing sources.

As mentioned earlier in the $PM_{2.5}$ information, in the event the MCAQD needs to move or change a violating $PM_{2.5}$ monitor, the department would hold a public hearing regarding the requested change. Details and documentation of the requested change, as well as all public comments, would then be forwarded to the EPA R9 for approval. Any action on the department's part will be dependent on EPA R9 approval.

Summary of 2018 Network Changes and Supporting Documentation

The MCAQD did not discontinue any pollutant monitoring at any site in 2018. Our focus is now on improving existing sites either by remodeling or installing new shelters at sites over the next few years. Other improvements to power supplies or communications may also occur.

1. The property that houses the North Phoenix site has been undergoing significant improvements by the City of Phoenix since October 2018. Due to construction activities, it was necessary to suspend PM monitoring from October 16th through November 29th. Otherwise, the AMD was able to stage mobile, temporary shelters so that pollutant monitoring interruption was kept at minimum. Once completed, a new shelter will be installed on the site near where the old shelter was located. The changes will improve safety and ease of maintenance for the AMD personnel.
2. A new shelter was installed at the Durango Complex site.

Proposed Network Modifications

The MCAQD is not submitting any proposals for major network modifications in 2019. Therefore, no monitoring interruptions are anticipated in 2019. At this time, only minor improvements to sites and/or shelters are planned, such as installing new shelters or upgrading existing shelters with items such as new flooring.

1. Blue Point (04-013-9702) – we plan on establishing a shelter at this site and vacating the Maricopa County Sherriff's building.
2. Falcon Field (04-013-1010) – we plan on establishing a shelter at this site and vacating the fire department's building.
3. Humboldt Mountain (04-013-9508) – we are working with Maricopa County's wireless/radio services to improve communication with this site by switching over to the County's wireless service and eliminating the dial-up connection. The monitoring station will be moving into a new building that is shared with County wireless services.
4. West 43rd (04-103-4009) – we plan on significantly upgrading the infrastructure and shelter at this site. The changes will improve safety and ease of maintenance for the AMD personnel.

Information Regarding Maricopa County's Supplementary Air Monitoring Programs

Personnel who work mobile monitoring and emergency response meet the Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training and medical monitoring requirements as per the U.S. Occupational Safety and Health Administration (OSHA) *29 CFR 1910.120*. Personnel attend an annual refresher training to remain certified.

Rapid Response Notification System (RRNS)

Maricopa County enjoys many days with clean air; however, there are days when PM_{10}, $PM_{2.5}$, or O_3 pollution levels approach or exceed the NAAQS. In particular, PM_{10} and $PM_{2.5}$ concentrations can build up quickly due to a high wind speed or a fire, respectively. Curtailing PM pollution from natural events is challenging; it requires planning and implementing control mechanisms to reduce the likelihood of an exceedance. However, anthropogenic activities that cause high PM concentrations near a site can often be addressed. If a quickly developing PM event is not addressed, it could result in a NAAQS exceedance that may have been avoidable.

To help reduce PM concentrations, the MCAQD implemented an automated alarm system that triggers email notifications and/or telephone calls to subscribers when concentrations of PM_{10} and $PM_{2.5}$ escalate. Subscribers include, but are not limited to: MCAQD's compliance and air monitoring personnel as well as industrial source representatives who can take action to reduce PM emissions caused by their work activities. The AirVision™ database is programmed to trigger alerts for elevated PM_{10} five-minute and hourly concentrations, and high $PM_{2.5}$ five-minute concentrations. Immediately following an hourly or five-minute PM concentration surpassing an assigned notification level, a high importance alert is sent out via email, text, and/or telephone to employees, stakeholders, and/or customers. In addition, Maricopa County enforces a "no burn restriction" when a $PM_{2.5}$ High Pollution Advisory (HPA) is issued by ADEQ.

The RRNS serves as a tool to manage high pollution events using a three-part system:

1. dissemination of as near real-time as possible air quality data to the community;
2. a notification system to alert MCAQD personnel, stakeholders, and customers of a pollution problem; and,
3. onsite response from department inspectors and stakeholders to identify and discourage pollution activity and to reduce the risk of pollution impacts.

The alerts requests that dust control permit holders inspect their sites as soon as possible and employ Best Available Control Measures to stabilize disturbed soils to reduce blowing dust following the notification. The MCAQCED inspectors also review the data and current circumstances, make site visits, or take other appropriate actions to help stop PM concentrations from increasing. To better expedite response actions, meteorological data such as wind speed and direction are also available in five-minute increments.

There are little to no immediate actions that can be taken to reduce high concentrations of gaseous CPs. Currently, no RRNS triggers have been established for gaseous pollutants. In general, gaseous pollutant concentrations are decreased through planning and implementing long-term emission controls on sources. Depending on local sources of gaseous pollutants, it may be feasible to have a source stop operating at such times to reduce emissions. For instance, SO_2 is prone to spiking during certain industrial activities, and at such a time, temporarily shutting down an operation may be a viable control measure. Although a short-term increase or spike may occur for a particular gas, we rarely see them unless they are associated with out-of-the-ordinary activities near the site.

Winter Burning Study

For the 2018 - 2019 winter season, MCAQD completed its spatial $PM_{2.5}$ study, which included the use of small sensors and a $PM_{2.5}$ speciation monitor. This study looked at spatial patterns of $PM_{2.5}$ in the wintertime.

Small Sensor Studies

Beginning in late 2018, in cooperation with EPA OAQPS, the MCAQD launched a project to determine the long-term operational viability and use of low-cost small sensors.

Shared Air Monitoring Responsibilities

For the MCAQD monitoring network, EPA requested that we work with the other S/L/T MOs within the MSA/CBSA to develop a shared monitoring agreement as specified by EPA R9. This is to ensure that each pollutant's network is adequately represented throughout Maricopa and Pinal Counties, which is the MSA/CBSA geographical area. In 2018, we checked in with EPA R9 representatives regarding their direction on how to proceed with this requirement. We are dependent upon representatives at EPA R9 to provide the specifics needed in such an agreement before we can satisfy this requirement. As soon as we do receive guidance, we will pursue working on this effort.

Information Regarding Additional Air Monitoring within Maricopa County

The ADEQ operates its own air monitoring surveillance system within the State of Arizona, which includes the JLG Supersite in central Phoenix. The JLG Supersite is part of the national air monitoring surveillance system and numerous SLAMS monitors operate there. In addition, ADEQ collects research data for other air monitoring programs at both the JLG Supersite and MCAQD's South Phoenix site. The research data support EPA's several air monitoring programs that include, but are not limited to: identifying airborne air toxics and ozone precursors, identifying the chemical composition of $PM_{2.5}$, and measuring visual haze.

Specifically, ADEQ performs air monitoring in Maricopa County for the Chemical Speciation Network (CSN), the Interagency Monitoring of Protected Visual Environments (IMPROVE), the National Air Toxics Trends Stations (NATTS), the National Core multi-pollutant monitoring stations (NCore), the Photochemical Assessment Monitoring Stations (PAMS), and the Urban Air Toxics Monitoring Program (UATMP). They also operate visibility cameras and meteorological monitors within the County. Occasionally, ADEQ may temporarily use other sites for special projects.

For more information about ADEQ's network, consult the ADEQ Air Quality Division's website.

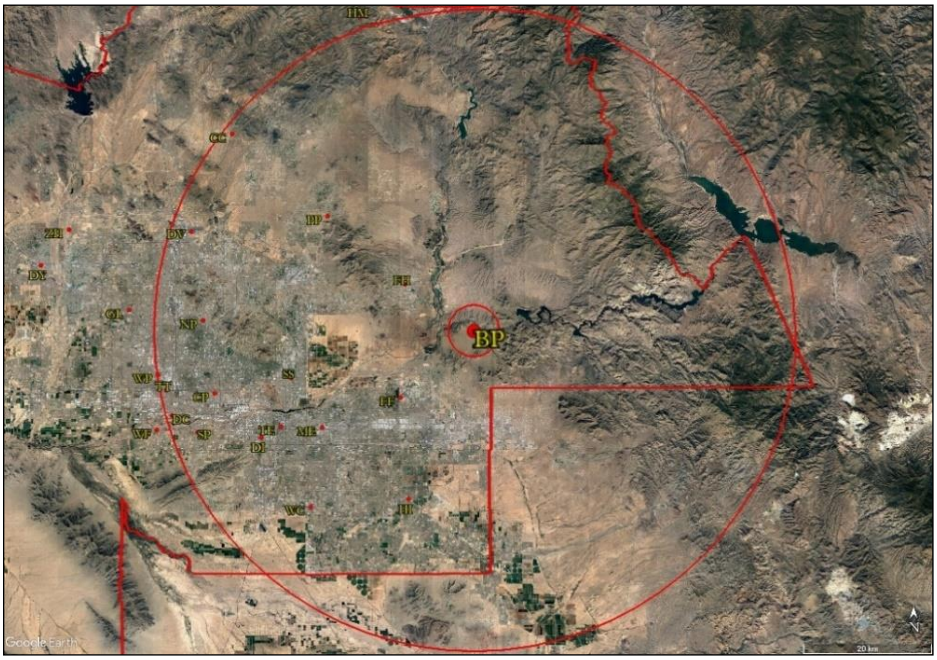
REFERENCES

1. The eCFR Title 40, Parts 50, 53, and 58
2. U.S. EPA Criteria Pollutant Information: https://www.epa.gov/criteria-air-pollutants
3. U.S. EPA NAAQS Information: https://www.epa.gov/criteria-air-pollutants/naaqs-table
4. U.S. EPA AIRNow webpage: https://www.airnow.gov/
5. U.S. EPA AQS AirData website: http://www.epa.gov/airdata
6. U.S. EPA OAQPS QA Webpage: https://www3.epa.gov/ttn/amtic/qalist.html
7. U.S. EPA Exceptional Events webpage: https://www.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events
8. U.S. EPA List of Areas Protected by the Regional Haze Program: https://www.epa.gov/visibility/list-areas-protected-regional-haze-program
9. EPA Region 9 Air Program Information: http://www.epa.gov/region9/air/index.html
10. Arizona SIP Information: http://www.azdeq.gov/environ/air/plan/index.html
11. ADEQ Natural and Exceptional Events Information: https://www.azdeq.gov/environ/air/plan/nee.html
12. MCAQD Online Interactive Air Quality Map: http://alert.fcd.maricopa.gov/alert/Google/v3/air.html
13. MCAQD Prior Annual Monitoring Plans and Network Assessments:http://www.maricopa.gov/1669/Air-Monitoring-Network-Plans-Assessments
14. MCAQD Dusts Sources, Control and Training: https://www.maricopa.gov/1913/Dust-Sources-Control-and-Training

APPENDIX I - 2018 AIR MONITORING DATA BY SITE

Site information includes photographs, site type and spatial scale, and population represented.

Blue Point (BP) (04-013-9702)



Site Location Bush Hwy. & Usery Pass Rd., Maricopa County

Spatial Scale Urban

Site Type Maximum O_3 Concentration

Site Description*:* The Blue Point site began operating in July 1995. A Maricopa County Sheriff's Sub-Station in Tonto National Forest houses the shelter. This site represents the maximum O_3 concentration and urban-scale downwind transport conditions. This site is located approximately 40 miles east of the Phoenix metropolitan area. This SLAMS location monitors for O_3. Meteorological monitors operating at this site include ambient temperature and wind speed/direction.

Pollutant	Metric	2016	2017	2018
O_3	Maximum 8-hr O_3 Average (ppm)	0.074†	0.084†	0.081†
	Number of O_3 Daily Exceedances	4	7	21
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.072#	0.072#	0.074#

† - Indicates an exceedance of the standard
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Buckeye (BE) (04-013-4011)

Site Location AZ Hwy. 85 & MC Hwy. 85, Buckeye

Spatial Scale Neighborhood for CO, O_3, and PM_{10}
Urban for NO_2

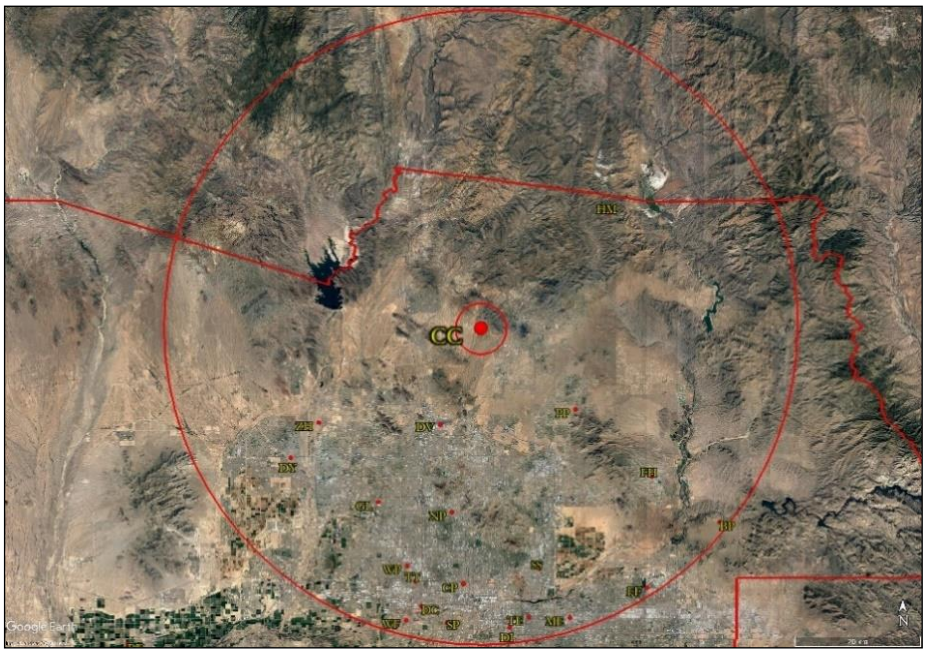
Site Type Population Exposure

Site Description: The Buckeye site was established on August 1, 2004. The Maricopa County Department of Transportation - Southwest Facility houses the site. The immediate area is agriculture and encroaching residential development. This site was closed temporarily in early 2017 for significant building and infrastructure upgrades. This SLAMS location monitors for CO, NO_2, O_3, and PM_{10}. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	0.4	0.6	0.6
	Number of 8-hr CO Exceedances	0	0	0
NO_2	Annual NO_2 Average (ppb)	6.90	7.71	7.67
	NO_2 1-hr Avg. 98th Percentile (ppb)	29.0	34.0	34.0
O_3	Maximum 8-hr O_3 Average (ppm)	0.064	0.074†	0.072†
	Number of O_3 Daily Exceedances	0	2	1
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.059	0.063	0.066
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	153	177†	285†‡
	Number of 24-hr PM_{10} Exceedances	0	2	3
	Annual PM_{10} Average (µg/m^3)	40.2	49.0*	43.0

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site – listed value is currently the official, maximum concentration in AQS
* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Cave Creek (CC) (04-013-4008)



Site Location 32nd St. & Carefree Hwy., Cave Creek

Spatial Scale Urban

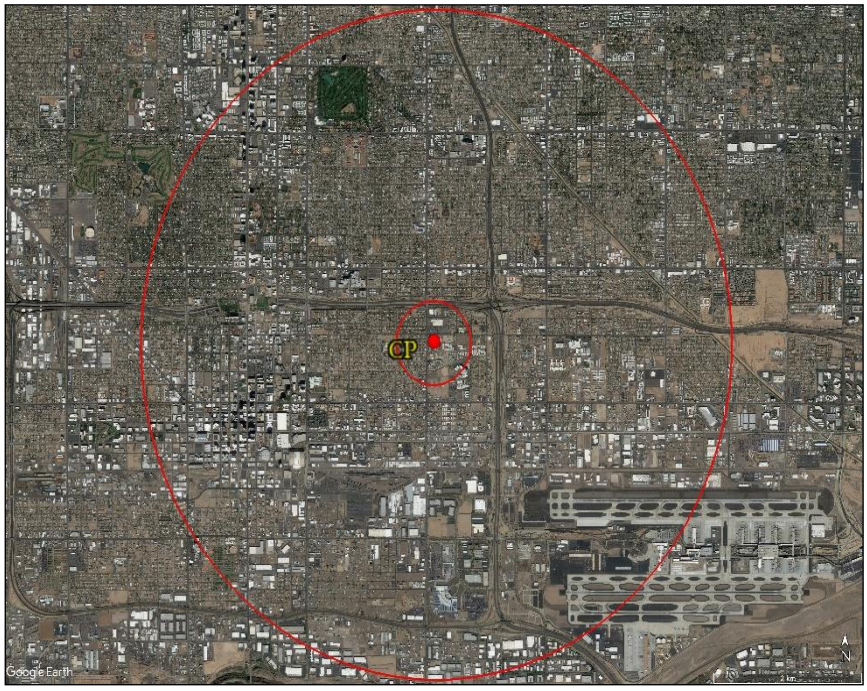
Site Type Maximum O_3 Concentration

Site Description: The Cave Creek site began operating in August 2001. The Maricopa County Cave Creek Recreation Area - Park Office houses the shelter. This site was chosen through discussions on modifying the O_3 network for the 2008 8-hr O_3 standard. This SLAMS location only monitors for O_3. Meteorological monitors operating at this site include ambient temperature, barometric pressure, rain, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
O_3	Maximum 8-hr O_3 Average (ppm)	0.073†	0.080†	0.079†
	Number of O_3 Daily Exceedances	5	6	11
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.071#	0.070	0.072#

† - Indicates an exceedance of the standard
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Central Phoenix (CP) (04-013-3002)



Site Location 19th St. & Roosevelt St., Phoenix

Spatial Scale Neighborhood

Site Type Population Exposure for CO, O_3, and PM_{10}
Highest Concentration for NO_2 and SO_2

Site Description: The Central Phoenix site has been in existence for over five decades and provides long-term historical data. The site is representative of high population exposure, e.g., greater than 5000 people per square mile. This SLAMS location monitors for CO, PM_{10}, NO_2, O_3, and SO_2. Meteorological monitors operating at this site include ambient temperature, barometric pressure, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	2.5	2.2	2.4
	Number of 8-hr CO Exceedances	0	0	0
NO_2	Annual NO_2 Average (ppb)	17.34	18.24	17.53
	NO_2 1-hour Average 98th Percentile (ppb)	59.0	62.0	56.0
O_3	Maximum 8-hr O_3 Average (ppm)	0.072†	0.078†	0.079†
	Number of O_3 Daily Exceedances	3	9	5
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.070	0.072#	0.072#
PM_{10}	Maximum 24-hr PM_{10} Average ($\mu g/m^3$)	106	158†‡	337†‡
	Number of 24-hr PM_{10} Exceedances	0	1	4
	Annual PM_{10} Average ($\mu g/m^3$)	32.6	35.7	39.1
SO_2	SO_2 1-hour 99th Percentile (ppb)	6.0	8.0	8.0
	Number of SO_2 Exceedances	0	0	0
	Annual SO_2 Avg. (ppb)	0.58	1.13	1.07

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site – listed value is currently the official, maximum concentration in AQS
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Deer Valley (DV) (04-013-4018)

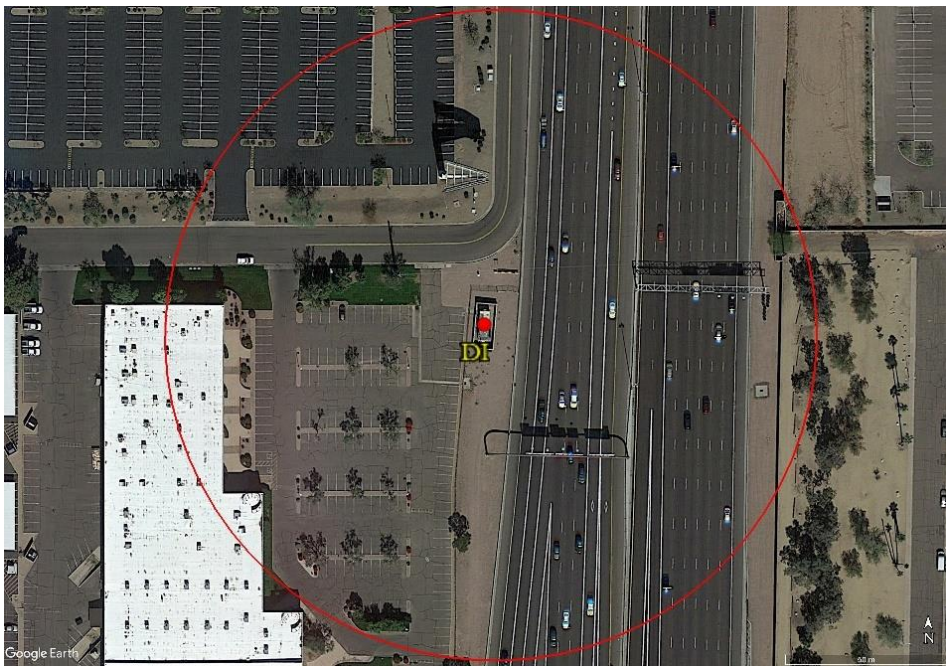
Site Location	7th Ave. & Deer Valley Rd.
Spatial Scale	Middle
Site Type	Source-Oriented

Site Description: The Deer Valley site is located on the grounds of the Deer Valley Airport in north Phoenix. This site started operating in July 2010, because changes in the Pb NAAQS necessitated that MCAQD begin Pb monitoring again. Ambient Pb monitoring had been discontinued in 1997, because concentrations were consistently much lower than the NAAQS at that time. The source of Pb emissions is the general aviation fuels used by propeller-driven aircraft; and, Deer Valley Airport is one of the busiest general aviation airports in Maricopa County. This SLAMS location monitors for Pb only. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
Pb	Maximum 24-hr Pb Average (µg/m^3)	0.073	0.092	0.099
	Number of Pb 24-hr Exceedances (> 0.15 µg/m^3)	0	0	0
	Maximum 3-month Rolling Pb Average (µg/m^3)	0.05	0.05	0.05

Source: EPA AQS database – *2016 - 2018 Quicklook Criteria Report (AMP450) and Maximum Values Report (AMP440)*

Diablo (DI) (04-013-4019)



Site Location Fairmont Dr. & Diablo Way, Tempe

Spatial Scale Micro

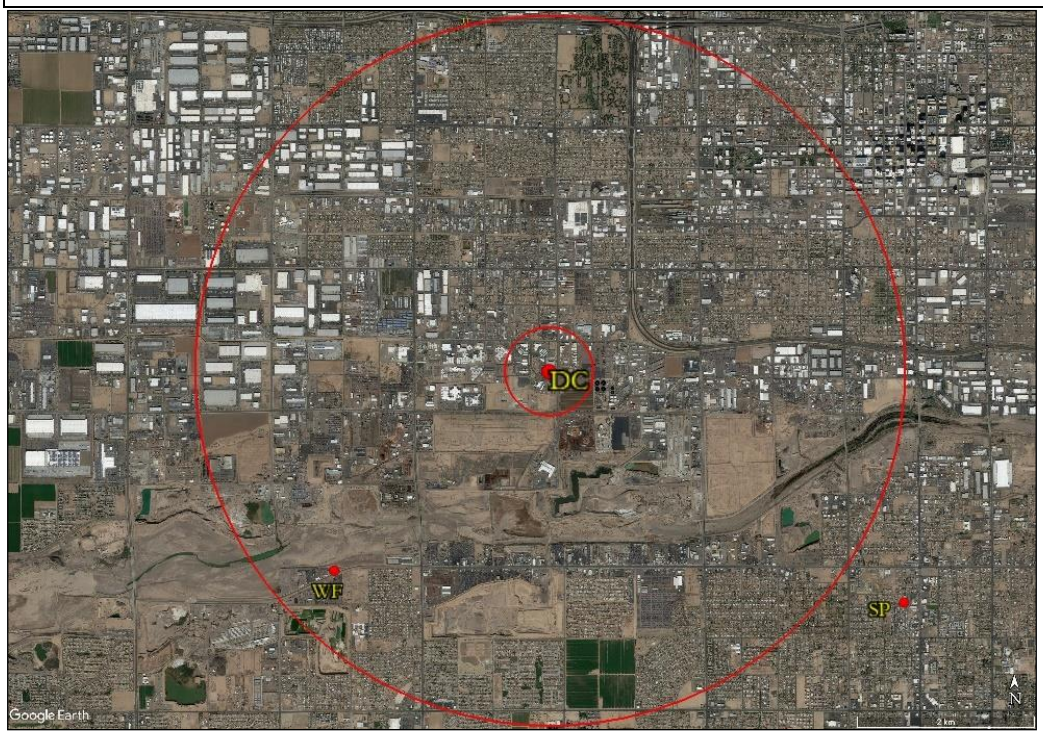
Site Type Source-Oriented

Site Description: The Diablo site was the first near-road air monitoring site established by MCAQD on the west side of the I-10 highway just south of the Fairmont/Diablo Way intersection. There is a concrete barrier between the highway and the frontage road, offering safety, and a secure shelter houses the monitoring instruments. This SLAMS location monitors for CO, NO_2, and $PM_{2.5}$. Meteorological monitors operating at this site include ambient temperature, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	1.5	1.7	1.6
	Number of 8-hr CO Exceedances	0	0	0
NO_2	Annual NO_2 Average (ppb)	21.47	21.71	18.93
	NO_2 1-hr Average 98th Percentile (ppb)	54.0	58.0	56.0
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m^3)	62.7†	30.6	49.0†‡
	Number of 24-hr $PM_{2.5}$ Exceedances	1	0	2
	Annual $PM_{2.5}$ Average (µg/m^3)	7.89	8.07	8.62
	$PM_{2.5}$ 98th Percentile Value (µg/m^3)	16.6	21.3	21.9

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
Source: EPA AQS database - *2016 - 2018 Quicklook Criteria Report (AMP450)*

Durango Complex (DC) (04-013-9812)



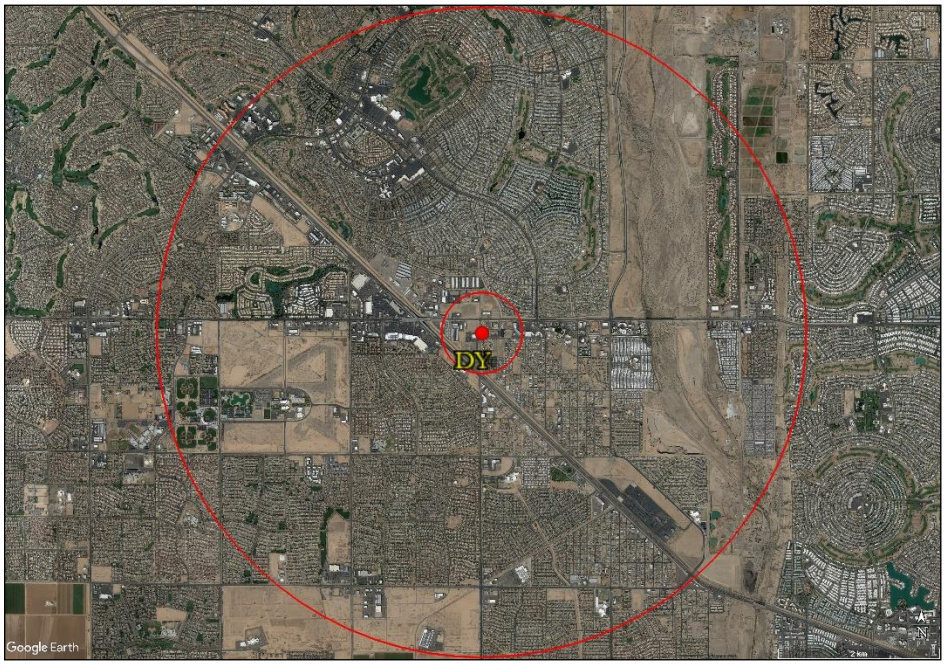
Site Location	27th Ave & Durango St., Phoenix
Spatial Scale	Neighborhood
Site Type	Highest Concentration

Site Description: This site is located at the Maricopa County Flood Control District storage yard. Monitoring began on January 6, 1999 as a maximum highest concentration site. This SLAMS location monitors for PM_{10}, $PM_{2.5}$, and SO_2. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	112	170†	282†‡
	Number of 24-hr PM_{10} Exceedances	0	3	3
	Annual PM_{10} Average (µg/m³)	33.0	49.1	43.0
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	64.2†	54.6†	115.3†
	Number of $PM_{2.5}$ 24-hr Exceedances	2	4	1
	Annual $PM_{2.5}$ Average (µg/m³)	9.48	10.25	10.10
	98th Percentile $PM_{2.5}$ Value (µg/m³)	22.7	30.6	25.7
SO_2	SO_2 1-hour 99th Percentile (ppb)	7.0	10.0	8.0
	Number of SO_2 Exceedances	0	0	0
	Annual SO_2 Average (ppb)	0.45	0.61	0.77

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
Source: EPA AQS database - *2016 - 2018 Quicklook Criteria Report (AMP450)*

Dysart (DY) (04-013-4010)



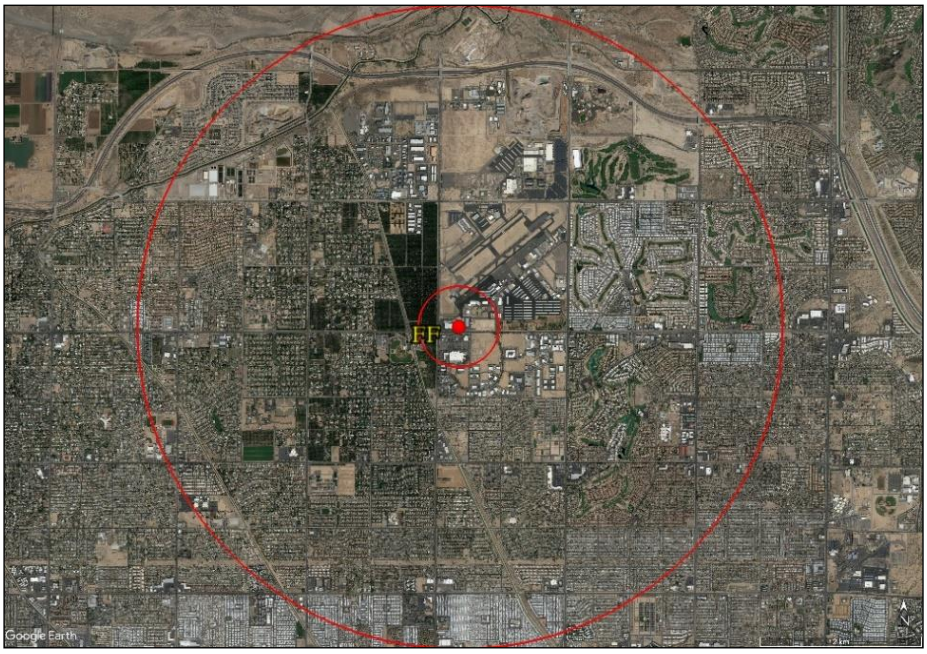
Site Location	Bell Rd. & Dysart Rd., Surprise
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: The Dysart site was established in July 2003. It is located at the Maricopa County Facility Maintenance Yard on the corner of Bell Rd. and Dysart Rd. The site is in a growing population area in the northwest valley. The land use around the site includes residential, commercial, and industrial operations. The location is approximately one mile west of the Agua Fria riverbed. The CO monitor ceased operation in 2016, and supporting information for this change is in Appendix III of the 2017 AMNP. This SLAMS location monitors for O_3 and PM_{10}. Meteorological monitors operating at this site include: ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	0.5	not operating	not operating
	Number of 8-hr CO Exceedances	0		
O_3	Maximum 8-hr O_3 Average (ppm)	0.069	0.087†	0.086†
	Number of Daily O_3 Exceedances	0	15	9
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.066	0.068	0.072#
PM_{10}	Maximum 24-hr PM_{10} Average ($\mu g/m^3$)	173†‡	168†‡	244†‡
	Number of 24-hr PM_{10} Exceedances	1	1	3
	Annual PM_{10} Average ($\mu g/m^3$)	28.8	29.4*	30.3

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Falcon Field (FF) (04-013-1010)



Site Location Greenfield Rd. & McKellips Rd., Mesa

Spatial Scale Neighborhood

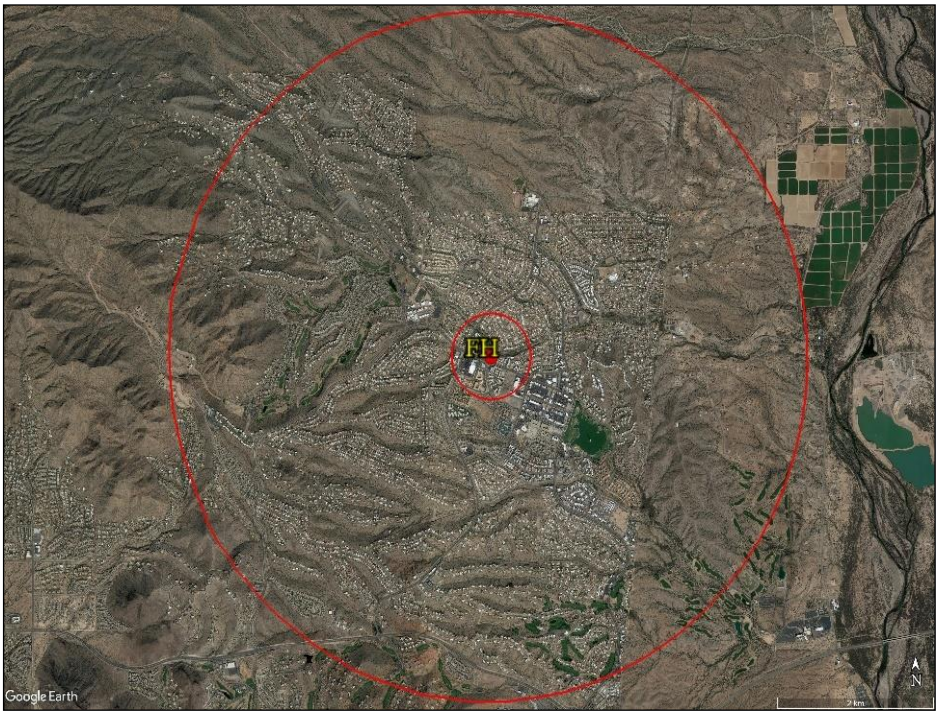
Site Type Population Exposure

Site Description: Monitoring began in June of 1989. The site is located at a fire station near an airfield within a growing residential area. This SLAMS location monitors for O_3 only. Meteorological monitors operating at this site include ambient temperature, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
O_3	Maximum 8-hr O_3 Average (ppm)	0.078†	0.084†	0.082†
	Number of O_3 Daily Exceedances	5	17	22
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.073#	0.074#	0.075#

† - Indicates an exceedance of the standard
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Fountain Hills (FH) (04-013-9704)



Site Location Fountain Hills Blvd. & Palisades Blvd., Fountain Hills

Spatial Scale Neighborhood

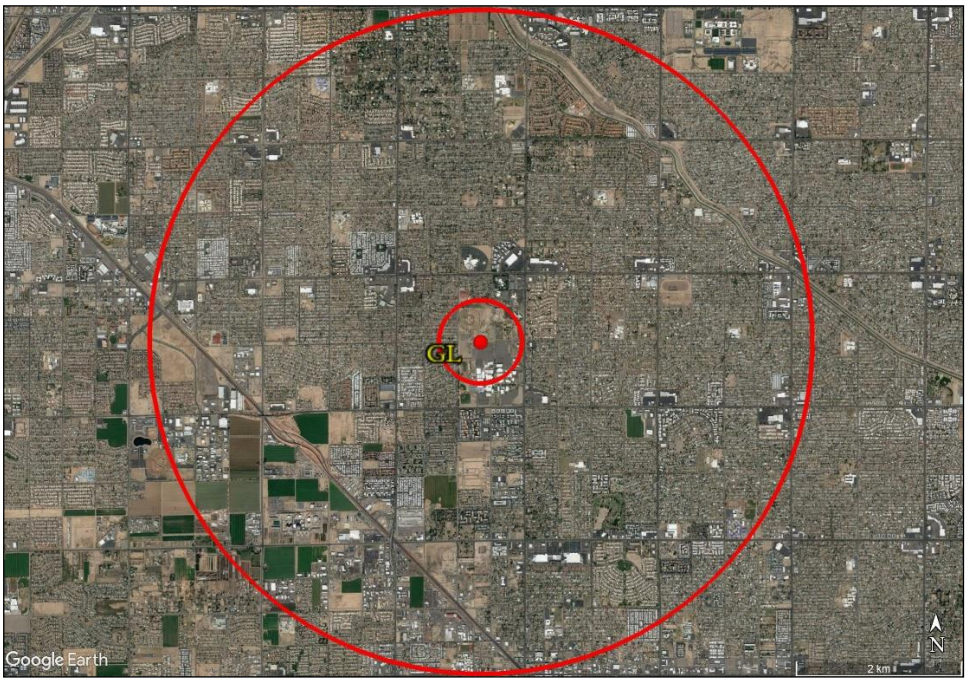
Site Type Maximum O_3 Concentration

Site Description: The site is located at a Fountain Hills fire station, and it became operational in April of 1996. The site is located approximately 15 miles downwind from the Phoenix metropolitan area and represents the high downwind O_3 concentrations on the fringes of the central basin district along the predominant summer/fall daytime wind direction. This SLAMS location monitors for O_3 only. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
O_3	Maximum 8-hr O_3 Average (ppm)	0.069	0.085†	0.084†
	Number of O_3 Daily Exceedances	0	6	14
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.068	0.070	0.072#

† - Indicates an exceedance of the standard
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Glendale (GL) (04-013-2001)



Site Location 59th Ave. & Olive Ave., Glendale

Spatial Scale Neighborhood

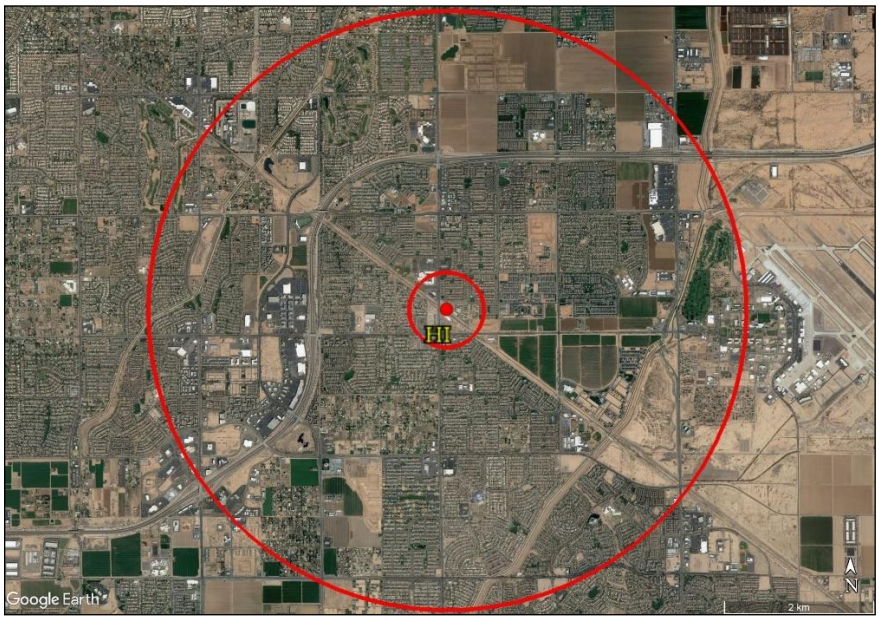
Site Type Population Exposure

Site Description: The site is located on the grounds of Glendale Community College in a populous residential area. Homes, various strip malls, food establishments, and parks surround the site. This SLAMS location monitors for O_3, PM_{10}, and $PM_{2.5}$. The CO monitor ceased operation in 2016, and supporting information for this change is in Appendix III of the 2017 AMNP. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	1.7	not operating	not operating
	Number of 8-hr CO Exceedances	0		
O_3	Maximum 8-hr O_3 Average (ppm)	0.071†	0.079†	0.77†
	Number of O_3 Daily Exceedances	1	4	3
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.068	0.068	0.069
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	180†‡	136	235††
	Number of 24-hr PM_{10} Exceedances	2	0	2
	Annual PM_{10} Average (µg/m³)	22.1	22.0	23.6
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	113.9†	40.0†	53.2†‡
	Number of 24-hr $PM_{2.5}$ Exceedances	2	1	1
	Annual $PM_{2.5}$ Average (µg/m³)	6.75	6.69	7.33
	$PM_{2.5}$ 98th Percentile Value (µg/m³)	17.7	16.7	19.5

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Higley (HI) (04-013-4006)



Site Location	Higley Rd. & Williams Field Rd., Gilbert
Spatial Scale	Neighborhood
Site Type	Population Exposure

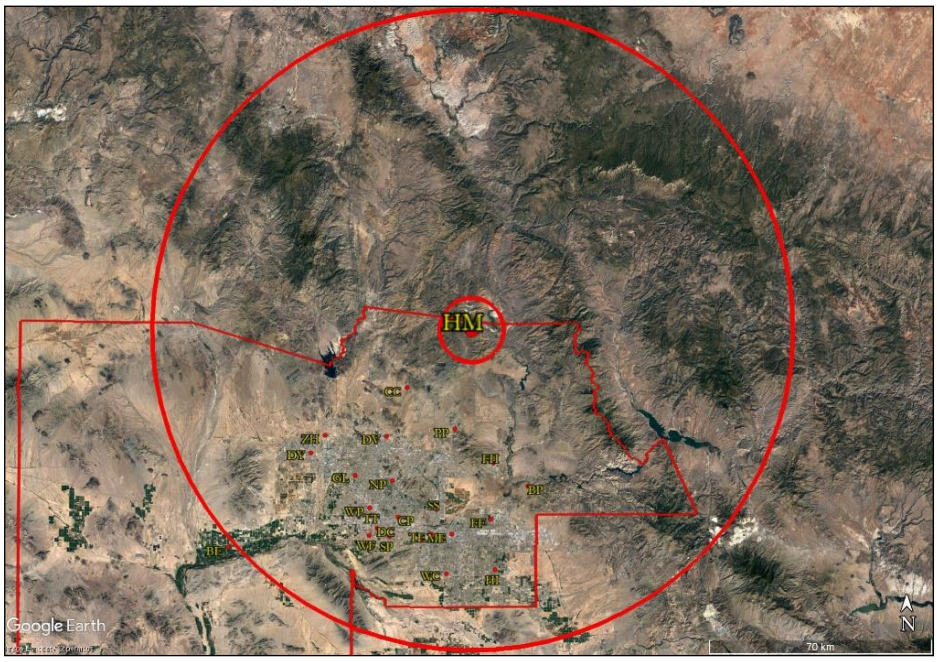
Site Description: Originally, in 1994, ADEQ set-up this site to monitor for background particulate concentrations near the urban limits of Maricopa County. Since then, urban expansion has enveloped the site, so it no longer serves its original intended purpose. The MCAQD has monitored for PM_{10} since the second quarter of 2000.

In March 2017, the monitoring station moved to a new physical location is just NE due to the prior property owner no longer being able to host the site. Supporting information for this change is in Appendix III of the 2017 AMNP. Monitoring for PM_{10} resumed in March 2017 after being suspended for about two and a half years. Meteorological monitors that operate at this site include: ambient temperature, barometric pressure, delta T, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
PM_{10}	Maximum 24-hr PM_{10} Average ($\mu g/m^3$)	Not Operating	147	215†‡
	Number of 24-hr PM_{10} Exceedances		0	5
	Annual PM_{10} Average ($\mu g/m^3$)		39.6*	38.1

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness
Source: EPA AQS database - *2016 - 2018 Quicklook Criteria Report (AMP450)*

Humboldt Mountain (HM) (04-013-9508)



Site Location Humboldt Mtn. Summit

Spatial Scale Regional

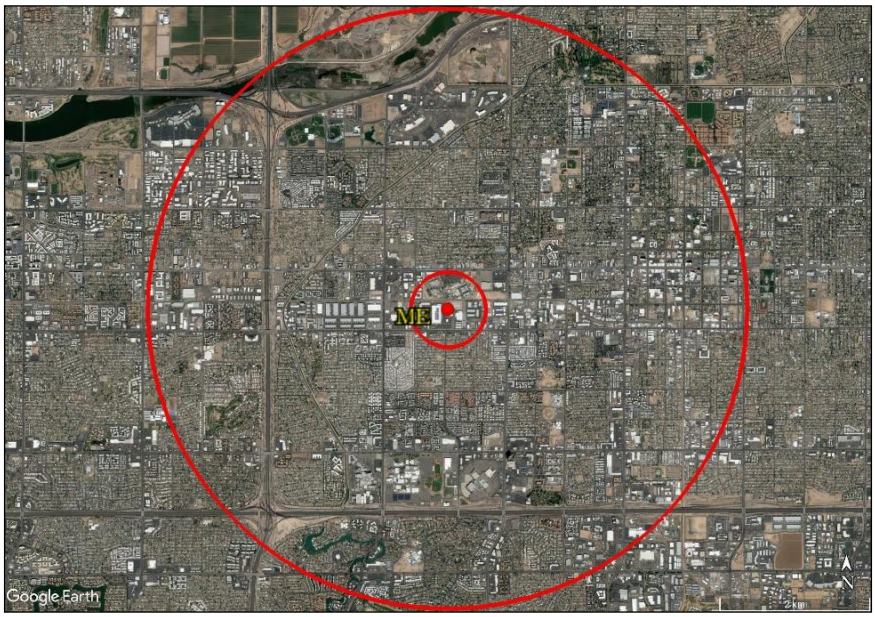
Site Type Maximum O_3 Concentration

Site Description: This site became operational in August 1995. The Humboldt Mountain site is located on Federal Aviation Agency (FAA) property, in a National Forest Service building within the Tonto National Forest. We anticipated moving into a new facility about 50 feet away from the old shelter location in 2018. However, the project was delayed due to contractor activities underway for the other land users. Currently, we expect the move to be completed sometime in 2019. This site is located approximately 40 miles north-northeast of the Phoenix metropolitan area at an elevation of 5190 feet. This SLAMS location monitors for O_3 only. Meteorological monitors operating at this site include: ambient temperature, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
O_3	Maximum 8-hr O_3 Average (ppm)	0.077†	0.084†	0.081†
	Number of O_3 Daily Exceedances	7	9	12
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.073#	0.073#	0.073#

† - Indicates an exceedance of the standard
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Mesa (ME) (04-013-1003)



Site Location Broadway Rd. & Brooks Ave., Mesa

Spatial Scale Neighborhood

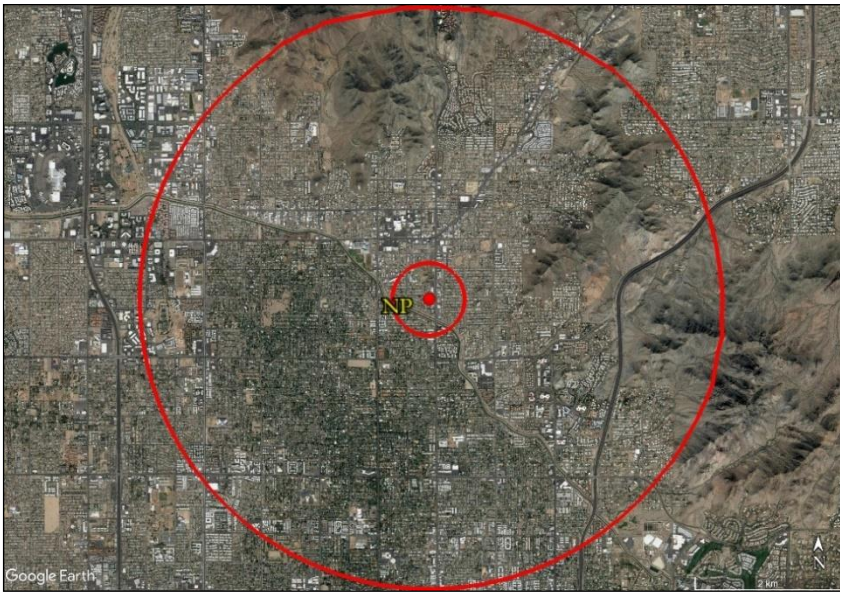
Site Type Population Exposure

Site Description: This site is located at the City of Mesa - Brooks Reservoir, which is an area that contains residential, commercial, and industrial properties. This SLAMS location monitors for CO, O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Avg. (ppm)	1.5	1.5	1.4
	Number of 8-hr CO Exceedances	0	0	0
O_3	Maximum 8-hr O_3 Average (ppm)	0.079†	0.082†	0.082†
	Number of O_3 Daily Exceedances	14	21	23
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.076#	0.076#	0.076#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	100	141	257†‡
	Number of 24-hr PM_{10} Exceedances	0	0	2
	Annual PM_{10} Average (µg/m^3)	21.1	24.0	24.3
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Avg. (µg/m^3)	83.0†	41.1†	41.1†‡
	Number of 24-hr $PM_{2.5}$ Exceedances	1	1	3
	Annual $PM_{2.5}$ Average (µg/m^3)	6.75	8.13	7.42
	$PM_{2.5}$ 98th Percentile Value (µg/m^3)	14.0	19.0	19.1

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

North Phoenix (NP) (04-013-1004)



Site Location 7th St. & Butler Ave., Phoenix

Spatial Scale Neighborhood

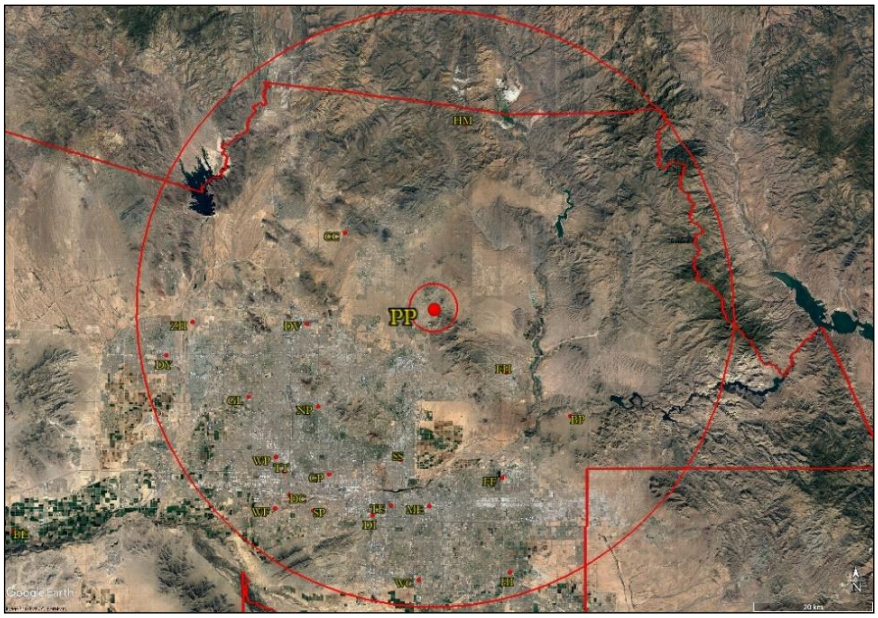
Site Type Population Exposure

Site Description: This site is located in the Sunnyslope area of North Phoenix. The site is surrounded by residential and commercial properties. This SLAMS location monitors for O_3, and PM_{10}, $PM_{2.5}$. The CO monitor ceased operation in 2016, and supporting information for this change is in Appendix III of the 2017 AMNP. Beginning in late 2018 through early 2019, the property underwent significant upgrades. Monitoring interruptions were kept to a minimum by temporarily staging shelters at various locations on the property to accommodate construction activities. Meteorological monitors operating at this site include ambient temperature, delta T (temperature inversion), barometric pressure, solar radiation, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	1.2	not operating	not operating
	Number of 8-hr CO Exceedances	0		
O_3	Maximum 8-hr O_3 Average (ppm)	0.078†	0.085†‡	0.085†
	Number of O_3 Daily Exceedances	11	25	14
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.075#	0.075#	0.076#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	141	122	216†‡
	Number of 24-hr PM_{10} Exceedances	0	0	2
	Annual PM_{10} Avg. (µg/m³)	20.7	21.2	21.3*
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	52.2†	32.6	45.2†‡
	Number of 24-hr $PM_{2.5}$ Exceedances	1	0	2
	Annual $PM_{2.5}$ Average (µg/m³)	6.47	7.46	7.35*
	$PM_{2.5}$ 98th Percentile Value (µg/m³)	16.3	18.9	18.7

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard
* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Pinnacle Peak (PP) (04-013-2005)



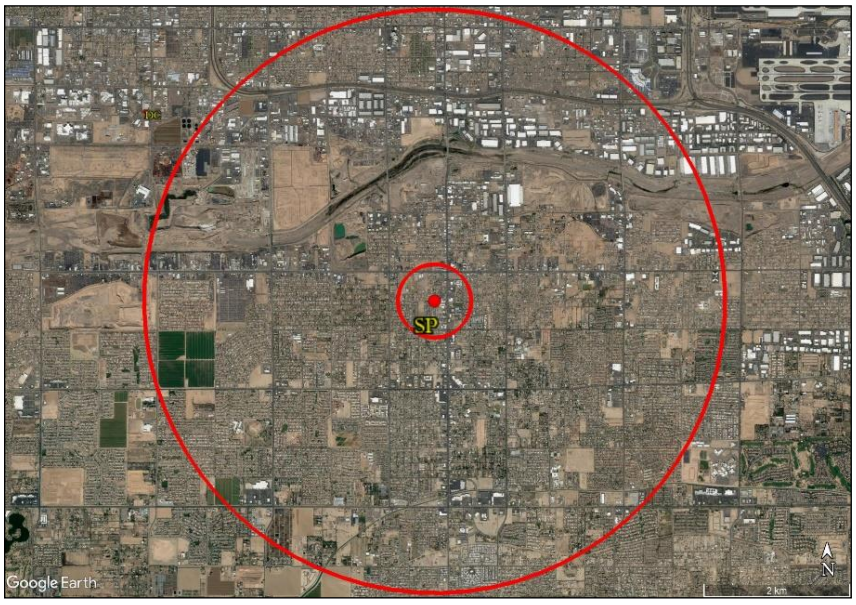
Site Location	Alma School & Happy Valley Rd., Scottsdale
Spatial Scale	Urban
Site Type	Maximum O_3 Concentration

Site Description: This site is located in the northeast valley. This site measures O_3 concentrations related to the transport of O_3 from central metropolitan Phoenix. This SLAMS location monitors for O_3 only. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
O_3	Maximum 8-hr O_3 Average (ppm)	0.076†	0.087†‡	0.090†
	Number of O_3 Daily Exceedances	11	18	27
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.077#	0.076#	0.077#

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

South Phoenix (SP) (04-013-4003)



Site Location Central Ave. & Broadway Rd., Phoenix

Spatial Scale Neighborhood

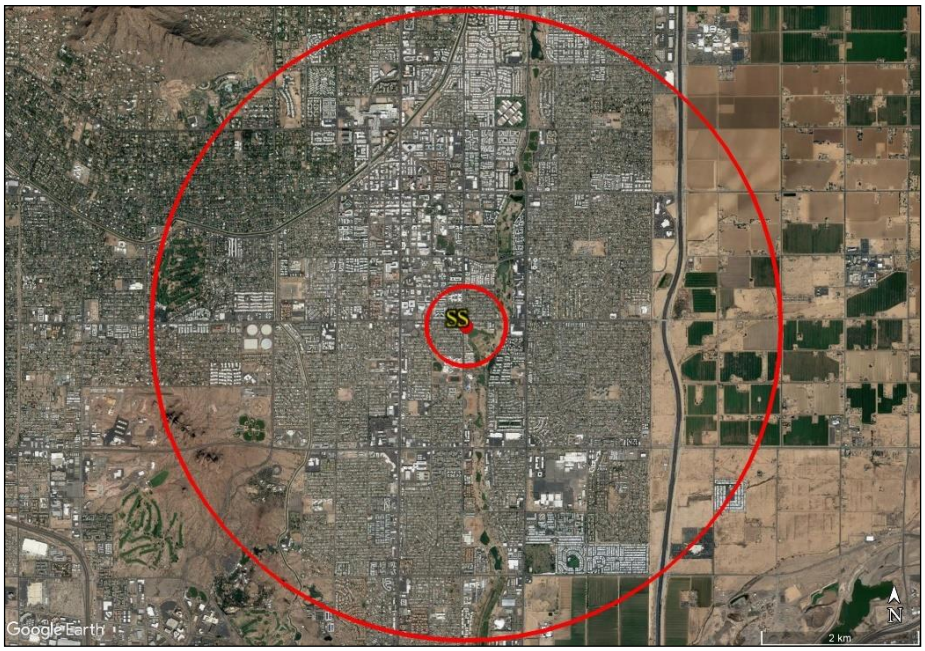
Site Type Population Exposure

Site Description: The site has operated at its current location since October 1999. The site borders a mixture of high population density residential and commercial properties. This SLAMS location monitors for CO, O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	2.3	2.6	3.2
	Number of 8-hr CO Exceedances	0	0	0
O_3	Maximum 8-hr O_3 Average (ppm)	0.071†	0.078†‡	0.078†
	Number of O_3 Daily Exceedances	1	11	6
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.070	0.070	0.070
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	130	129	171†‡
	Number of 24-hr PM_{10} Exceedances	0	0	2
	Annual PM_{10} Average (µg/m^3)	31.1	35.1	33.8
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m^3)	108.0†	86.2†	134.1†‡
	Number of 24-hr $PM_{2.5}$ Exceedances	1	4	4
	Annual $PM_{2.5}$ Average (µg/m^3)	8.45	9.0	9.37
	$PM_{2.5}$ 98th Percentile value (µg/m^3)	22.8	25.0	27.8

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

South Scottsdale (SS) (04-013-3003)



Site Location Thomas Rd. & Miller Rd., Scottsdale

Spatial Scale Neighborhood

Site Type Population Exposure

Site Description: The South Scottsdale site is located at a City of Scottsdale fire station. The area surrounding the site is residential with a density of 2500 to 5000 persons per square mile. This SLAMS location monitors for O_3 and PM_{10}. The CO monitor ceased operation in 2016, and supporting information for this change is in Appendix III of the 2017 AMNP. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

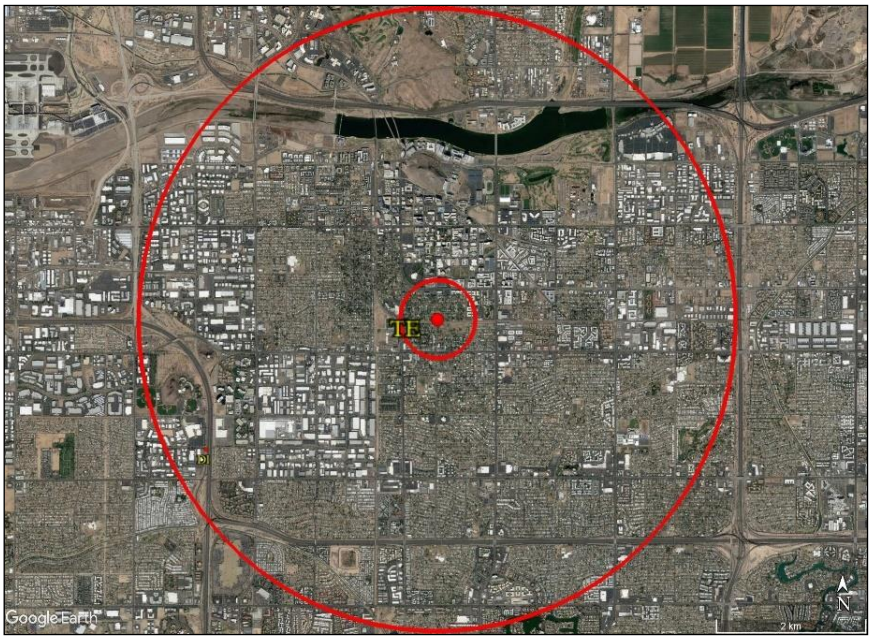
Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	1.8	not operating	not operating
	Number of 8-hr CO Exceedances	0		
O_3	Maximum 8-hr O_3 Average (ppm)	0.075†	0.080†	0.072†
	Number of O_3 Daily Exceedances	3	2	3
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.070	0.069	0.070
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	115	170†‡	341†‡
	Number of 24-hr PM_{10} Exceedances	0	1	4
	Annual PM_{10} Average (µg/m^3)	28.2	28.6	31.2

† - Indicates an exceedance of the standard

‡ - Indicates EEs at this site

Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Tempe (TE) (04-013-4005)



Site Location	Apache Blvd. & College Ave., Tempe
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: The site began operating in 2000 and it is located near the ASU Tempe Campus. The site is surrounded by residential homes, some high-density residential properties, and a railroad track. This SLAMS location monitors for O_3, PM_{10}, and $PM_{2.5}$. The CO monitor ceased operation in 2016, and supporting information for this change is in Appendix III of the 2017 AMNP. Meteorological monitors operating at this site include ambient temperature, delta T (temperature inversion), rain, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	1.8	not operating	not operating
	Number of 8-hr CO Exceedances	0		
O_3	Maximum 8-hr O_3 Average (ppm)	0.071†	0.068	0.071†
	Number of O_3 Daily Exceedances	1	0	2
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.063	0.061	0.067
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	77	124	235†‡
	Number of 24-hr PM_{10} Exceedances	0	0	2
	Annual PM_{10} Average (µg/m^3)	21.8	23.8	26.8
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m^3)	59.2†	34.5	38.2†‡
	Number of 24-hr $PM_{2.5}$ Exceedances	1	0	1
	Annual $PM_{2.5}$ Average (µg/m^3)	6.84	7.10	7.11
	$PM_{2.5}$ 98th Percentile Value (µg/m^3)	14.9	16.2	16.3

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Thirty-Third (TT) (04-013-4020)

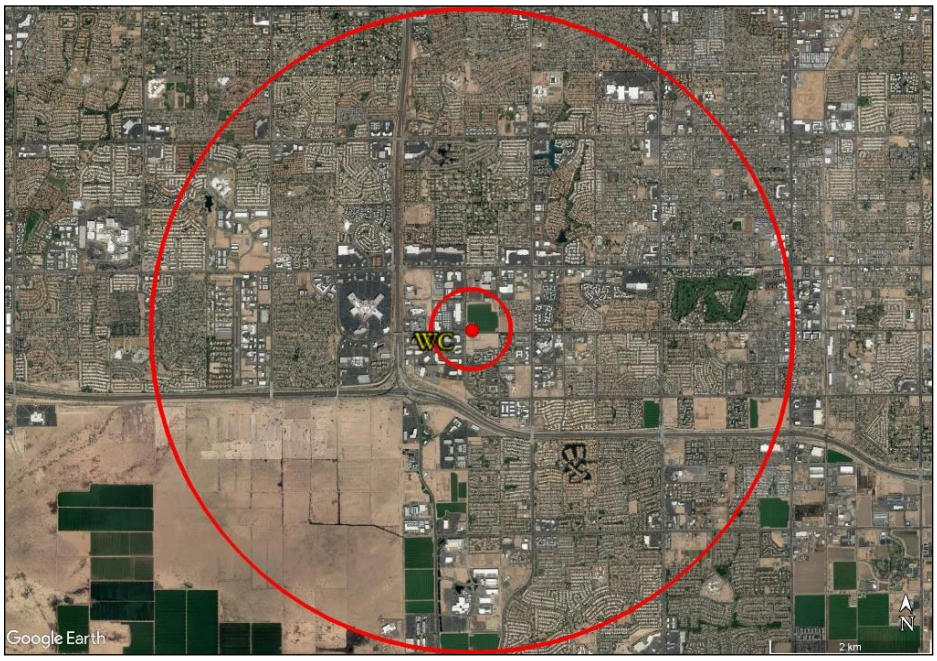
Site Location	Interstate-10 & 33rd Ave., Phoenix
Spatial Scale	Micro
Site Type	Source-Oriented

Site Description: The Thirty-Third site was the second near-road air monitoring site established by MCAQD on the south side of the I-10 highway just east of 33rd Avenue. The site is oriented on an east-west highway and is located about three meters (midway) downslope from 33rd Avenue toward the I-10. It is accessible from the frontage road, offering safety, and we have erected a secure shelter for housing the monitoring instruments. Meteorological monitors operating at this site include ambient temperature and wind speed/direction.

Pollutant	Metric	2016	2017	2018
NO_2	Annual NO_2 Average (ppb)	30.89	30.63	28.25
	NO_2 1-hr 98th Percentile Average (ppb)	63.0	67.0	62.0

Source: EPA AQS database - *2016 - 2018 Quicklook Criteria Report (AMP450)*

West Chandler (WC) (04-013-4004)



Site Location	Frye Rd. & Ellis St., Chandler
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: This site was established in January 1995. A wide range of land uses surrounds the site including residential, agriculture, and heavy industry such as semiconductor manufacturing plants and liquid air storage. The PM_{10} monitor's scale of representativeness was first established as middle scale, but it was changed to neighborhood in June 2018 to better reflect land use currently surrounding the site and to match general monitoring requirements found in *40 CFR Part 58 Appendix D, Table D-1.* This SLAMS location monitors for CO, O_3, and PM_{10}. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	1.4	1.5	1.7
	Number of 8-hr CO Exceedances	0	0	0
O_3	Maximum 8-hr O_3 Average (ppm)	0.072†	0.079†	0.075†
	Number of O_3 Daily Exceedances	3	8	2
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.069	0.071	0.070
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	134	250†‡	382†‡
	Number of 24-hr PM_{10} Exceedances	0	1	7
	Annual PM_{10} Average (µg/m^3)	29.7	33.4	35.1

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
Source: EPA AQS database - *2016 - 2018 Quicklook Criteria Report (AMP450)*

West 43rd Avenue (WF) (04-013-4009)

Site Location 43rd Ave. & Broadway Rd., Phoenix

Spatial Scale Middle

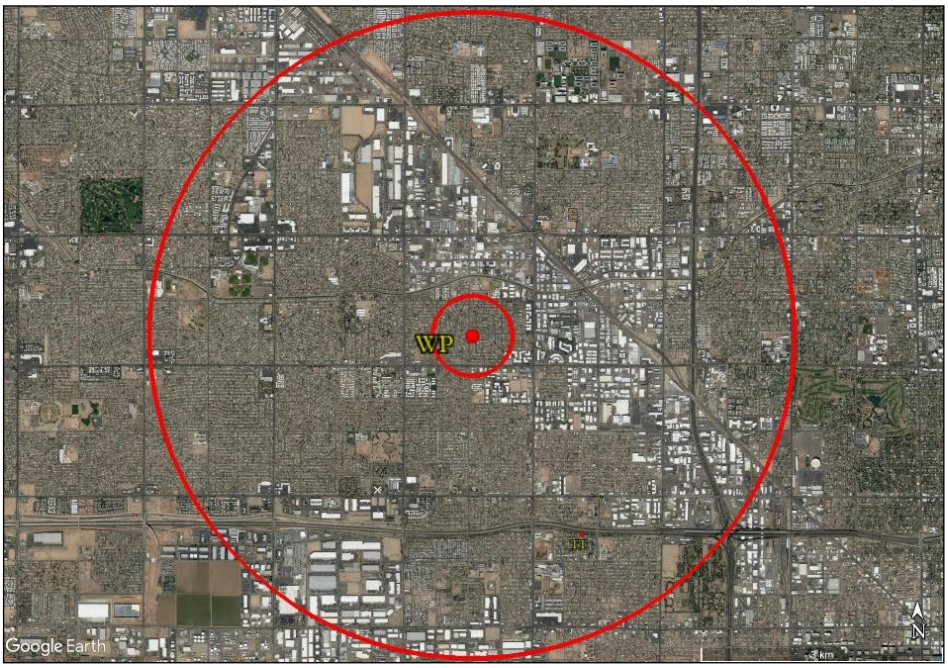
Site Type Highest Concentration

Site Description: Monitoring began at the site in the 2nd quarter of 2002. This site is located at a Maricopa County Department of Transportation storage lot and is surrounded by a combination of heavy industry and residential homes. The main purpose of the site is to measure maximum PM_{10} concentration. The sources around the site include sand and gravel operations, automobile and metal recycling facilities, landfills, paved and unpaved haul roads, and cement casting. This SLAMS location monitors for PM_{10}. Meteorological monitors operating at this site include ambient temperature, barometric pressure, delta T (temperature inversion), and wind speed/direction.

Pollutant	Metric	2016	2017	2018
PM_{10}	Maximum 24-hr PM_{10} Avg. ($\mu g/m^3$)	174†‡	164†‡	385†‡
	Number of 24-hr PM_{10} Exceedances	1	2	8
	Annual PM_{10} Avg. ($\mu g/m^3$)	46.9	56.3	60.4

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site
Source: EPA AQS database - *2016 - 2018 Quicklook Criteria Report (AMP450)*

West Phoenix (WP) (04-013-0019)



Site Location 39th Ave. & Earll Dr., Phoenix

Spatial Scale Neighborhood

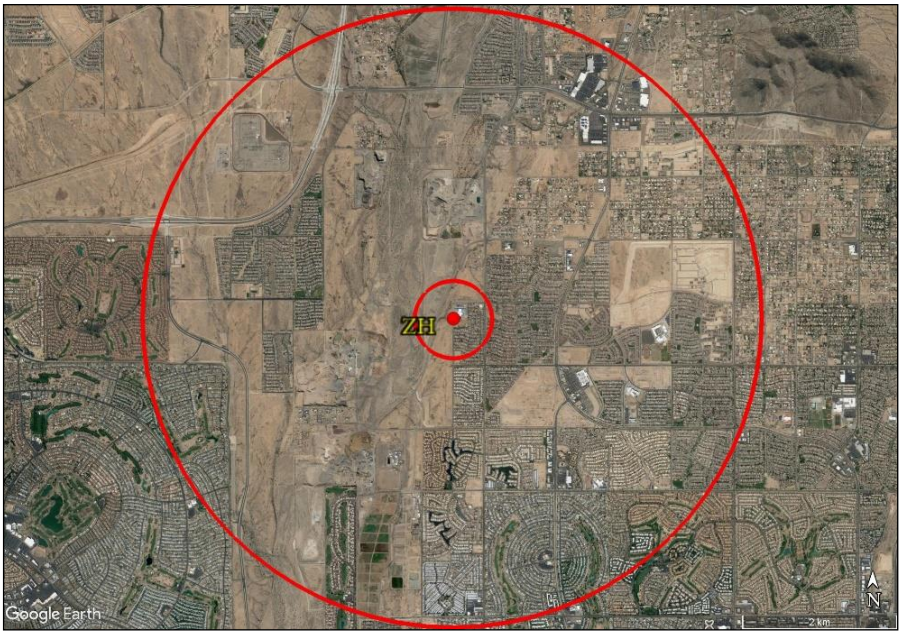
Site Type Population Exposure for CO, NO_2, O_3, PM_{10}, and Highest Concentration for $PM_{2.5}$

Site Description: This site has been operational since 1984. The spatial scale for the West Phoenix site is Neighborhood. It is located in an area of stable, high-density residential properties. This SLAMS location monitors for CO, NO_2, O_3, PM_{10}, and $PM_{2.5}$. In addition, this is a QA collocation site for $PM_{2.5}$ where the MCAQD operates one filter-based $PM_{2.5}$ FRM sampler along with one continuous $PM_{2.5}$ FEM analyzer as per *40 CFR Part 58 Appendix A*. Meteorological monitors operating at this site include ambient temperature, barometric pressure, delta T (temperature inversion), and wind speed/direction.

Pollutant	Metric	2016	2017	2018
CO	Maximum 8-hr CO Average (ppm)	3.2	3.4	4.4
	Number of 8-hr CO Exceedances	0	0	0
NO_2	Annual NO_2 Average (ppb)	16.24	16.99	16.12
	NO_2 1-hr Average 98th Percentile (ppb)	54.0	56.0	52.0
O_3	Maximum 8-hr O_3 Average (ppm)	0.073†	0.088†‡	0.086†
	Number of O_3 Daily Exceedances	6	14	6
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.073#	0.074#	0.074#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	172†‡	119	259†‡
	Number of 24-hr PM_{10} Exceedances	1	0	4
	Annual PM_{10} Average (µg/m³)	28.9	32.3	33.3
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	152.1†	86.6†	199.3
	Number of 24-hr $PM_{2.5}$ Exceedances	1	5	3
	Annual $PM_{2.5}$ Average (µg/m³)	8.78	9.56	9.92
	$PM_{2.5}$ 98th Percentile Value	23.8	30.2	30.6

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site - listed value is the highest official current AQS reading
# - Indicates a violation of the standard
Source: EPA AQS database - *2016 – 2018 Quicklook Criteria Report (AMP450)*

Zuni Hills (ZH) (04-013-4016)



Site Location 109th Ave. & Deer Valley Rd., Phoenix

Spatial Scale Neighborhood

Site Type Population Exposure

Site Description: This site opened in December 2009 and is located on the campus of the Zuni Hills Elementary School. This SLAMS location monitors for PM_{10}, only. Meteorological monitors operating at this site include ambient temperature and wind speed/direction.

Pollutant	Metric	2016	2017	2018
PM_{10}	Maximum 24-hr PM_{10} Average ($\mu g/m^3$)	174†‡	166†‡	231†‡
	Number of 24-hr PM_{10} Exceedances	1	1	2
	Annual PM_{10} Average ($\mu g/m^3$)	26.5	28.1	27.8

† - Indicates an exceedance of the standard
‡ - Indicates EEs at this site - listed value is the highest official current AQS reading.
Source: EPA AQS database - *2016 - 2018 Quicklook Criteria Report (AMP450)*

APPENDIX II - 2018 EPA-REQUIRED SITE METADATA

This appendix provides site and monitor metadata required by *40 CFR §58.10 and Appendices A, B, C, D, and E,* as applicable. Information includes, but is not limited to, quality assurance metrics, site identification and type, each monitor's type and scale of representativeness as well as basic monitoring objective, collection frequency of air samples, e.g., operating schedule, and any proposals to change a monitoring station within the next 18 months.

See Appendix IV for the Glossary

BLUE POINT	
County Abbreviation: BP AQS ID: 04-013-9702 Address: Bush Highway & Usery Pass Rd., Maricopa County Lat/Long Coordinates: 33.54558 N, -111.60972 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**O_3**
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed in 2018	4
Dates of PE Audits	01/24/18 05/14/18 07/11/18 11/14/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	01/01/1993

BLUE POINT		
Monitor Type		SLAMS
Monitor Make - Model		Teledyne API – Model 400T
Method Code		087
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Max Ozone Concentration
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Urban
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc (degrees around probe/inlet)		360º
Probe/Sample Line Material (Gases)		FEP
Pollutant Sample Residence Time (Gases)		8.9 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	11 meters
Distance from Dripline of Closest Tree(s)		11 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		Bush Highway
Distance and Direction to Road		160 meters, S
Average Daily Traffic Count		1,000
Groundcover		Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

BUCKEYE				
County ID: BE AQS ID: 04-013-4011 Address 26453 W MC85 Coordinates: 33.36985 N, -112.62068 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa				
General Information				
Pollutant	**CO**	**NO_2**	**O_3**	**PM_{10}**
Parameter Code	42101	42602	44201	81102
Parameter Occurrence Code	1	1	1	1
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs				
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	26	26	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	Not Applicable	Not Applicable	23
Frequency of Flow Rate Verifications				Bi-Weekly
Number of PE Audits Performed in 2018	5	5	5	4
Dates of PE Audits	01/04/18 03/27/18 04/10/18 06/05/18 10/23/18	05/10/18 06/05/18 06/19/18 08/28/18 12/18/18	01/18/18 06/05/18 07/17/18 09/11/18 12/04/18	01/04/18 04/10/18 07/03/18 10/09/18

BUCKEYE					
Annual Precision & PE Audit Reports Submitted to AQS?		Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission		04/30/19	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable					
Appendix C Requirements - Monitoring Methodology					
Date Sampling Started		08/01/2004	08/01/2004	08/01/2004	08/01/2004
Monitor Type		SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model		Teledyne API – Model 300T	Teledyne API – Model 200T	Teledyne API – Model 400T	Thermo – TEOM 1405-S
Method Code		093	099	087	079
PM Monitor Flow Type		Not Applicable	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type		Not Applicable	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FRM	FRM	FEM	FEM
Appendix D Requirements - Network Design Criteria					
Site Type		Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Urban	Neighborhood	Neighborhood
Monitoring Season		Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria					
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		4 meters	4 meters	4 meters	4 meters
Probe Sample Line Material		FEP	FEP	FEP	Not Applicable
Pollutant Sample Residence Time		9.44 seconds	9.44 seconds	9.44 seconds	Not Applicable
Airflow Arc		360º	360º	360º	360º
	Horizontal	0 meters	0 meters	0 meters	0 meters

BUCKEYE					
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Vertical	4.4 meters	4.4 meters	4.4 meters	4.4 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		7.6 meters	7.6 meters	7.6 meters	7.6 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		U.S. Hwy 85	U.S. Hwy 85	U.S. Hwy 85	U.S. Hwy 85
Distance and Direction to Road		31 meters, N	31 meters, N	31 meters, N	31 meters, N
Average Daily Traffic Count		3,000	3,000	3,000	3,000
Groundcover		Pavement	Pavement	Pavement	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

CAVE CREEK		
County ID: CC AQS ID: 04-013-4008 Address: 37019 N Lava Lane, Phoenix Coordinates: 33.82169 N, -112.01726 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	
Parameter Code	44201	
Parameter Occurrence Code	1	
Collection Frequency	Continuous	
Analysis Method (filter samples only)	Not Applicable	
Any Proposal to Remove or Move Monitor?	No	
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	
Are Data Comparable to Respective NAAQS?	Yes	
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	
Frequency of 1-Point Precision (QC) Checks	Bi-weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	
Frequency of Flow Rate Verifications		
Number of PE Audits Performed in 2018	5	
Dates of PE Audits	01/30/18 04/09/18 07/30/18	10/08/18 11/05/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	
Date of Annual Data Certification Submission	04/30/19	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	07/20/2001	
Monitor Type	SLAMS	

CAVE CREEK		
Monitor Make - Model		Teledyne - API Model 400T
Method Code		087
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Max Ozone Concentration
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Urban
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		11.39 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	10 meters
Distance from Dripline of Closest Tree(s)		10 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		32nd Street
Distance and Direction to Road		240 meters, NE
Average Daily Traffic Count		1,000
Groundcover		Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

CENTRAL PHOENIX					
County ID: CP AQS ID: 04-013-3002 Address: 1645 E Roosevelt St., Phoenix Coordinates: 33.45797 N, -112.04659 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa					
General Information					
Pollutant	**CO**	**NO_2**	**O_3**	**SO_2**	**PM_{10}**
Parameter Code	42101	42602	44201	42401	81102
Parameter Occurrence Code	1	6	1	4	4
Collection Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs					
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	26	26	26	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-weekly	Bi-weekly	Bi-weekly	Bi-weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	26
Frequency of Flow Rate Verifications					Bi-weekly
Number of PE Audits Performed in 2018	5	4	5	5	4

CENTRAL PHOENIX					
Dates of PE Audits	01/25/18 05/01/18 07/10/18 11/27/18 12/27/18	01/09/18 03/19/18 07/10/18 09/06/18	03/26/18 06/01/18 06/12/18 07/24/18 12/11/18	01/25/18 03/19/18 04/06/18 08/07/18 10/02/18	01/09/18 04/06/18 07/10/18 10/04/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable					
Appendix C Requirements - Monitoring Methodology					
Date Sampling Started	10/01/1966	01/01/1967	06/01/1967	01/01/1965	04/01/1985
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API - Model 300T	Teledyne API - Model 200T	Teledyne API - Model 400T	Teledyne API - Model 100T	Thermo - TEOM 1405-S
Method Code	093	099	087	100	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria					
Site Type	Population Exposure	Highest Concentration	Population Exposure	Highest Concentration	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria					
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

CENTRAL PHOENIX						
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360°	360°	360°	360°	360°
Probe Sample Line Material		FEP	FEP	FEP	FEP	Not Applicable
Pollutant Sample Residence Time		9.28 seconds	9.28 seconds	9.28 seconds	9.28 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters	2 meters	2.4 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		16th Street	16th Street	16th Street	16th Street	16th Street
Distance and Direction to Road		88 meters, W	88 meters, W	88 meters, W	88 meters, W	91 meters, W
Average Daily Traffic Count		24,000	24,000	24,000	24,000	24,000
Nearest Major Roadway B		Roosevelt St.	Roosevelt St.	Roosevelt St.	Roosevelt St.	Roosevelt St.
Distance and Direction to Road		75 meters, N	75 meters, N	75 meters, N	75 meters, N	75 meters, N
Average Daily Traffic Count		21,637	21,637	21,637	21,637	21,637
Groundcover		Pavement	Pavement	Pavement	Pavement	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

DEER VALLEY		
County ID: DV AQS ID: 04-013-4018 Address: 1030 West Deer Valley Road, Phoenix Coordinates: 33.68449 N, -112.08633 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**Pb Primary**	**Pb Secondary**
Note: This is a collocated site for Pb.		
Parameter Code	14129	14129
Parameter Occurrence Code	1	2
Collection Frequency	1 in 6 days	1 in 12 days
Analysis Method (filter samples only)	EQL-0510-191	EQL-0510-191
Analytical Laboratory	Pima County Regional Wastewater Reclamation Department (RWRD) Compliance and Regulatory Affairs Office (CRAO) Laboratory	
Any Proposal to Remove or Move Monitor?	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	Not Applicable	Not Applicable
Frequency of 1-Point QC Checks		
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	42	42
Frequency of Flow Rate Verifications	Quarterly	Quarterly
Number of Required Collocation Assessments	30	
Number of Valid Collocation Assessments in 2018	41	
Number of Collocation Assessments in 2018	55	
Number of PE Audits Performed in 2018	3	4

DEER VALLEY		
Date of PE Audits	05/09/18 08/02/18 10/10/18	02/16/18 05/09/18 08/02/18 10/10/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	07/21/2010	07/21/2010
Monitor Type	SLAMS	SLAMS
Monitor Make - Model	Thermo TSP Sampler	Thermo TSP Sampler
Method Code	802	802
Pb Monitor Flow Type	High Volume	High Volume
Pb Monitor Collection Type	Total Suspended Particulates	Total Suspended Particulates
Method Type (FRM, FEM, ARM)	FRM	FRM
Appendix D Requirements - Network Design Criteria		
Site Type	Source-Oriented	Source-Oriented
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Middle Scale	Middle Scale
Monitoring Season	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers	2.7 meters	2.7 meters
Probe Height (distance above ground level to inlet)	3.6 meters	3.6 meters
Airflow Arc	360º	360º
Probe Sample Line Material	Not Applicable	Not Applicable
Pollutant Sample Residence Time	Not Applicable	Not Applicable
Filter Sample Material	Glass	Glass

DEER VALLEY			
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters
	Vertical	1.2 meters	1.2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	6 meters	6 meters
	Vertical	0 meters	0 meters
Distance from Dripline of Closest Tree(s)		no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		Deer Valley Rd.	Deer Valley Rd.
Distance and Direction to Road		300 meters, S	300 meters, S
Average Daily Traffic Count		6,452	6,452
Groundcover		Pavement	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

DIABLO			
County ID: DI AQS ID: 04-013-4019 Address: 1919 W. Fairmount Dr., Tempe Coordinates: 33.39623 N, -111.96799 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**CO**	**NO_2**	**$PM_{2.5}$**
Parameter Code	42101	42602	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	26	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	Not Applicable	27
Frequency of Flow Rate Verifications			Bi-Weekly
Number of PE Audits Performed in 2018	4	4	5
Dates of PE Audits	04/04/18 04/18/18 10/18/18 11/01/18	01/10/18 02/21/18 07/11/18 12/18/18	01/11/18 04/18/18 05/03/18 07/11/18 10/04/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable			

DIABLO				
Appendix C Requirements - Monitoring Methodology				
Date Sampling Started		2/13/2014	02/13/2014	05/01/2014
Monitor Type		SLAMS	SLAMS	SLAMS
Monitor Make - Model		Teledyne API – 300T	Teledyne API – 200T	Thermo - TEOM 1405-DF
Method Code		093	099	182
PM Monitor Flow Type		Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type		Not Applicable	Not Applicable	Dichotomous
Method Type (FRM, FEM, ARM)		FRM	FRM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Source-Oriented	Source-Oriented	Source-Oriented
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Micro	Micro	Micro
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Probe Height (distance above *ground level* to inlet)		5 meters	5 meters	5 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		FEP	FEP	Not Applicable
Pollutant Sample Residence Time		6.87 seconds	6.87 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction

DIABLO				
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	12 meters	12 meters	12 meters
	Vertical	4.6 meters	4.6 meters	4.6 meters
Distance from Dripline of Closest Tree(s)		10.7 meters	10.7 meters	10.7 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Interstate-10	Interstate-10	Interstate-10
Distance and Direction to Road		30 meters, E	30 meters, E	30 meters, E
Average Daily Traffic Count		275,000	275,000	275,000
Nearest Major Roadway B		Fairmount Dr.	Fairmount Dr.	Fairmount Dr.
Distance and Direction to Road		18 meters, N	18 meters, N	18 meters, N
Average Daily Traffic Count		3,000	3,000	3,000
Groundcover		Pavement / Gravel	Pavement / Gravel	Pavement / Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

DURANGO COMPLEX			
County ID: DC AQS ID: 04-013-9812 Address: 2702 RC Esterbrooks Blvd., Phoenix Coordinates: 33.42650 N, -112.11812 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**PM_{10}**	**$PM_{2.5}$**	**SO_2**
Parameter Code	81102	88101	42401
Parameter Occurrence Code	1	3	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Yes	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	Not Applicable	Not Applicable	26
Frequency of 1-Point Precision (QC) Checks			Bi-Weekly
Number of Flow Rate Checks Performed in 2018 (PM or Pb)	26	26	Not Applicable
Frequency of Flow Rate Verifications	Bi-Weekly	Bi-Weekly	
Number of PE Audits Performed in 2018	4	4	4
Dates of PE Audits	01/10/18 04/05/18 07/11/18 10/05/18	01/10/18 04/05/18 07/11/18 10/05/18	02/07/18 05/02/18 08/08/18 10/31/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable			

DURANGO COMPLEX				
Appendix C Requirements - Monitoring Methodology				
Date Sampling Started		07/01/1999	07/01/2005	01/01/2011
Monitor Type		SLAMS	SLAMS	SLAMS
Monitor Make - Model		Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF	Teledyne API – 100T
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
Method Code		208	182	100
PM Monitor Flow Type		Low Volume	Low Volume	Not Applicable
PM Monitor Collection Type		Dichotomous	Dichotomous	Not Applicable
Method Type (FRM, FEM, ARM)		FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Population Exposure	Highest Concentration	Highest Concentration
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Middle
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Distance between PM monitor inlets?		0 meters	0 meters	Not Applicable
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		Not Applicable	Not Applicable	FEP
Pollutant Sample Residence Time		Not Applicable	Not Applicable	5.18 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters

DURANGO COMPLEX				
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	12 meters	12 meters	12 meters
	Vertical	6 meters	6 meters	6 meters
Distance from Dripline of Closest Tree(s)		10.7 meters	10.7 meters	10.7 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		27th Ave	27th Ave	27th Ave
Distance and Direction to Road		78 meters, E	76 meters, E	76 meters, E
Average Daily Traffic Count		16,000	16,000	16,000
Groundcover		Pavement	Pavement	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

DYSART		
County ID: DY AQS ID: 04-013-4010 Address: 16825 N Dysart Rd., Surprise Coordinates: 33.63718 N, -112.34185 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	**PM_{10}**
Parameter Code	44201	81102
Parameter Occurrence Code	1	1
Collection Frequency	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	28
Frequency of Flow Rate Verifications		Bi-Weekly
Number of PE Audits Performed in 2018	2	4
Dates of PE Audits	04/20/18 10/18/18	01/11/18 04/20/18 07/26/18 10/04/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable		

DYSART			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started		7/21/2003	07/14/2003
Monitor Type		SLAMS	SLAMS
Monitor Make - Model		Teledyne API – 400T	Thermo - TEOM 1405-S
Method Code		087	079
PM Monitor Flow Type		Not Applicable	Low Volume
PM Monitor Collection Type		Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FEM	FEM
Appendix D Requirements - Network Design Criteria			
Site Type		Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers		Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		5.4 meters	5.2 meters
Airflow Arc		360º	360º
Probe Sample Line Material		FEP	Not Applicable
Pollutant Sample Residence Time		4.43 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters
	Vertical	3 meters	3 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	15.2 meters	15.2 meters
	Vertical	3 meters	3 meters
Distance from Dripline of Closest Tree(s)		no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue

DYSART		
Nearest Major Roadway A	Dysart	Dysart
Distance and Direction to Road	17 meters, W	12 meters, W
Average Daily Traffic Count	12,000	12,000
Nearest Major Roadway B	Bell Rd	Bell Rd
Distance and Direction to Road	495 meters, N	460 meters, N
Average Daily Traffic Count	43,000	43,000
Groundcover	Pavement / Gravel	Pavement / Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

FALCON FIELD		
County ID: FF AQS ID: 04-013-1010 Address: 4530 E McKellips Rd, Mesa Coordinates: 33.45244 N, -111.73327 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	
Parameter Code	44201	
Parameter Occurrence Code	1	
Collection Frequency	Continuous	
Analysis Method (filter samples only)	Not Applicable	
Any Proposal to Remove or Move Monitor?	No	
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	
Are Data Comparable to Respective NAAQS?	Yes	
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	
Frequency of Flow Rate Verifications		
Number of PE Audits Performed in 2018	4	
Dates of PE Audits	01/10/18 02/07/18 02/23/18	07/25/18 08/08/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	
Date of Annual Data Certification Submission	04/30/19	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	06/01/1989	
Monitor Type	SLAMS	

FALCON FIELD		
Monitor Make - Model		Teledyne API – 400T
Method Code		087
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Population Exposure
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		18.33 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	1 meter
	Vertical	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	24.4 meters
	Vertical	3 meters
Distance from Dripline of Closest Tree(s)		no tree
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		McKellips
Distance and Direction to Road		58 meters, S
Average Daily Traffic Count		29,000
Groundcover		Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

FOUNTAIN HILLS		
County ID: FH AQS ID: 04-013-9704 Address: 16426 E. Palisades Blvd., Fountain Hills Coordinates: 33.61092 N, -111.72534 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	
Parameter Code	44201	
Parameter Occurrence Code	1	
Collection Frequency	Continuous	
Analysis Method (filter samples only)	Not Applicable	
Any Proposal to Remove or Move Monitor?	No	
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	
Are Data Comparable to Respective NAAQS?	Yes	
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	
Frequency of Flow Rate Verifications		
Number of PE Audits Performed in 2018	4	
Dates of PE Audits	02/14/18 06/20/18	09/26/18 12/18/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	
Date of Annual Data Certification Submission	04/30/19	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	04/01/1996	
Monitor Type	SLAMS	
Monitor Make – Model	Teledyne API – 400T	

FOUNTAIN HILLS		
Method Code		087
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Max Ozone Concentration
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		4.19 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	2 meters
	/Vertical	0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions
	Vertical	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	24.4 meters
	Vertical	4.8 meters
Distance from Dripline of Closest Tree(s)		15 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		Palisades Blvd
Distance and Direction to Road		70 meters, SW
Average Daily Traffic Count		8,000
Groundcover		Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

GLENDALE			
County ID: GL AQS ID: 04-013-2001 Address: 6001 W Olive, Glendale Coordinates: 33.57453 N, -112.19193 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	44201	81102	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	Not Applicable	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	27	27
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2018	3	4	4
Dates of PE Audits	04/12/18 04/26/18 10/11/18	02/01/18 05/10/18 08/02/18 11/09/18	02/01/18 05/10/18 08/02/18 11/09/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable			

GLENDALE				
Appendix C Requirements - Monitoring Methodology				
Date Sampling Started		01/01/1974	07/01/1987	6/1/2011
Monitor Type		SLAMS	SLAMS	SLAMS
Monitor Make - Model		Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
Method Code		087	208	182
PM Monitor Flow Type		Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type		Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)		FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	0 meters	0 meters
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time		4.71 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters

GLENDALE				
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions	no obstructions
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Olive Ave	Olive Ave	Olive Ave
Distance and Direction to Road		225 meters, S	227 meters, S	227 meters, S
Average Daily Traffic Count		25,000	25,000	25,000
Nearest Major Roadway B		59th Ave	59th Ave	59th Ave
Distance and Direction to Road		475 meters, E	430 meters, E	430 meters, E
Average Daily Traffic Count		30,500	30,500	30,500
Groundcover		Pavement	Pavement	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

HIGLEY	
County ID: HI AQS ID: 04-013-4006 Address: 2207 S Higley Rd., Gilbert Coordinates: 33.30995 N, -111.72003 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**PM_{10}**
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Not Applicable
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	Not Applicable
Frequency of 1-Point Precision (QC) Checks	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	26
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed in 2018	4
Dates of PE Audits	02/05/18 05/14/18 08/06/18 11/13/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable	

HIGLEY		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started		07/01/2000
Monitor Type		SLAMS
Monitor Make - Model		Thermo – TEOM 1405-S
Method Code		079
PM Monitor Flow Type		Low Volume
PM Monitor Collection Type		Size Specific
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Population Exposure
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time		Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions
	Vertical	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	7.6 meters
	Vertical	1.5 meters
Distance from Dripline of Closest Tree(s)		15.2 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway A		Higley Rd

HIGLEY	
Distance and Direction to Road	117 meters, E
Average Daily Traffic Count	11,500
Nearest Major Roadway B	Williams Field Rd
Distance and Direction to Road	410 meters, S
Average Daily Traffic Count	11,500
Groundcover	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

HUMBOLDT MOUNTAIN		
County ID: HM AQS ID: 04-013-9508 Address: E State Hwy 562- FAA Radar Station, Tonto National Forest Coordinates: 33.98280 N, -111.79871 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	
Parameter Code	44201	
Parameter Occurrence Code	1	
Collection Frequency	Continuous	
Analysis Method (filter samples only)	Not Applicable	
Any Proposal to Remove or Move Monitor?	No	
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	
Are Data Comparable to Respective NAAQS?	Yes	
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	
Frequency of Flow Rate Verifications		
Number of PE Audits Performed in 2018	4	
Dates of PE Audits	02/08/18 04/05/18	10/03/18 12/12/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	
Date of Annual Data Certification Submission	04/30/19	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	01/01/1993	
Monitor Type	SLAMS	
Monitor Make - Model	Teledyne API – 400T	

HUMBOLDT MOUNTAIN		
Method Code		087
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Max Ozone Concentration
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Regional
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		6.91 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Dripline of Closest Tree(s)		no tree
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		No Major Roadway - Remote Mountaintop Access using E. State Hwy 562
Distance and Direction to Road		Not Applicable
Average Daily Traffic Count		Not Applicable
Groundcover		Soil / Vegetation

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

MESA				
County ID: ME AQS ID: 04-013-1003 Address: 310 S Brooks, Mesa Coordinates: 33.41018 N, -111.86536 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa				
General Information				
Pollutant	**CO**	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs				
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	26	Not Applicable	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	Not Applicable	27	27
Frequency of Flow Rate Verifications			Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2018	5	4	4	4
Dates of PE Audits	01/10/18 03/14/18 04/18/18 06/14/18 01/18/18	01/10/18 04/05/18 06/28/18 08/23/18	02/07/18 05/03/18 08/07/18 11/01/18	02/07/18 05/03/18 08/07/18 11/01/18

MESA				
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable				
Appendix C Requirements - Monitoring Methodology				
Date Sampling Started	01/01/1978	11/1/2012	11/1/2012	11/1/2012
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
Method Code	093	087	208	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors	Not Applicable	Not Applicable	0 meters	0 meters
NOTE: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
Probe Height (distance above ground level to inlet)	4.4 meters	4.4 meters	4.4 meters	4.4 meters
Airflow Arc	360º	360º	360º	360º
Probe Sample Line Material	FEP	FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time	6.04 seconds	6.04 seconds	Not Applicable	Not Applicable

MESA					
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		Broadway Rd.	Broadway Rd.	Broadway Rd.	Broadway Rd.
Distance and Direction to Road		305 meters, S	305 meters, S	305 meters, S	305 meters, S
Average Daily Traffic Count		33,000	33,000	33,000	33,000
Groundcover		Pavement/Gravel	Pavement/Gravel	Pavement/Gravel	Pavement/Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

NORTH PHOENIX			
County ID: NP AQS ID: 04-013-1004 Address: 601 E Butler Dr., Phoenix Coordinates: 33.56031 N, -112.06619 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	44201	81102	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	Not Applicable	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	23	23
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2018	6	2	2
Dates of PE Audits	02/09/18 06/01/18 06/15/18 08/24/18 10/19/18 12/28/18	02/21/18 12/28/18	02/21/18 12/28/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable			

NORTH PHOENIX			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	01/01/1975	9/1/2011	9/1/2011
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Note: The same monitor measures PM_{10} and $PM_{2.5}$.			
Method Code	087	208	182
PM Monitor Flow Type	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria			
Site Type	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors	Not Applicable	0 meters	0 meters
NOTE: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.			
Probe Height (distance above ground level to inlet)	4.6 meters	4.5 meters	4.5 meters
Airflow Arc	360º	360º	360º
Probe Sample Line Material	FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time	4.52 seconds	Not Applicable	Not Applicable

NORTH PHOENIX				
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		3 meters	3 meters	3 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		7th Street	7th Street	7th Street
Distance and Direction to Road		75 meters, E	75 meters, E	75 meters, E
Average Daily Traffic Count (ADT)		32,000	32,000	32,000
Groundcover		Gravel	Gravel	Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

PINNACLE PEAK		
County ID: PP AQS ID: 04-013-2005 Address: 24295 N Alma School Rd., Scottsdale Coordinates: 33.70639 N, -111.85575 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	
Parameter Code	44201	
Parameter Occurrence Code	1	
Collection Frequency	Continuous	
Analysis Method (filter samples only)	Not Applicable	
Any Proposal to Remove or Move Monitor?	No	
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	
Are Data Comparable to Respective NAAQS?	Yes	
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	
Frequency of Flow Rate Verifications		
Number of PE Audits Performed in 2018	5	
Dates of PE Audits	01/05/18 02/15/18 06/26/18	08/05/18 12/19/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	
Date of Annual Data Certification Submission	04/30/19	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	02/01/1988	
Monitor Type	SLAMS	

PINNACLE PEAK		
Monitor Make - Model		Teledyne API – 400T
Method Code		087
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Max Ozone Concentration
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Urban
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.7 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		4.38 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2.7 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Dripline of Closest Tree(s)		10 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		Happy Valley Rd.
Distance and Direction to Road		61 meters, S
Average Daily Traffic Count		16,000
Groundcover		Pavement / Grass

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

SOUTH PHOENIX				
County ID: SP AQS ID: 04-013-4003 Address: 33 W Tamarisk St., Phoenix Coordinates: 33.40314 N, -112.07526 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa				
General Information				
Pollutant	**CO**	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs				
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	26	Not Applicable	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	Not Applicable	26	26
Frequency of Flow Rate Verifications			Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2018	2	5	4	4
Dates of PE Audits	02/04/18 04/11/18 10/12/18 11/07/18	01/03/18 04/11/18 06/21/18 11/07/18 12/21/18	02/14/18 05/11/18 08/02/18 11/07/18	02/14/18 05/11/18 08/02/18 11/07/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes

SOUTH PHOENIX				
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable				
Appendix C Requirements - Monitoring Methodology				
Date Sampling Started	10/01/1999	10/01/1999	7/1/2007	05/01/2010
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
Method Code	093	087	208	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors	Not Applicable	Not Applicable	0 meters	0 meters
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
Probe Height (distance above ground level to inlet)	4.4 meters	4.4 meters	4.3 meters	4.3 meters
Airflow Arc	360°	360°	360°	360°
Probe Sample Line Material	FEP	FEP	Not Applicable	Not Applicable

SOUTH PHOENIX					
Pollutant Sample Residence Time		4.71 seconds	4.71 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	11 meters	11 meters	11 meters	11 meters
	Vertical	3 meters	3 meters	3 meters	3 meters
Distance from Dripline of Closest Tree(s)		11 meters	11 meters	11 meters	11 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Central Ave.	Central Ave.	Central Ave.	Central Ave.
Distance and Direction to Road		168 meters, E	168 meters, E	165 meters, E	165 meters, E
Average Daily Traffic Count		24,000	24,000	24,000	24,000
Nearest Major Roadway B		Broadway Rd.	Broadway Rd.	Broadway Rd.	Broadway Rd.
Distance and Direction to Road		385 meters, N	385 meters, N	385 meters, N	385 meters, N
Average Daily Traffic Count		18,000	18,000	18,000	18,000
Groundcover		Pavement	Pavement	Pavement	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

SOUTH SCOTTSDALE		
County ID: SS AQS ID: 04-013-3003 Address: 2857 N Miller Rd., Scottsdale Coordinates: 33.47968 N, -111.91711 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	**PM_{10}**
Parameter Code	44201	81102
Parameter Occurrence Code	1	1
Collection Frequency	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	26
Frequency of Flow Rate Verifications		Bi-Weekly
Number of PE Audits Performed in 2018	5	4
Dates of PE Audits	01/08/18 06/25/18 07/23/18 08/20/18 10/17/18	02/05/18 05/14/18 08/06/18 11/20/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable		

SOUTH SCOTTSDALE			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started		01/01/1974	09/01/2012
Monitor Type		SLAMS	SLAMS
Monitor Make - Model		Teledyne API – 400T	Thermo - TEOM 1405-S
Method Code		087	079
PM Monitor Flow Type		Not Applicable	Low Volume
PM Monitor Collection Type		Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FEM	FEM
Appendix D Requirements - Network Design Criteria			
Site Type		Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers		Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters	3 meters
Airflow Arc		360º	360º
Probe Sample Line Material		FEP	Not Applicable
Pollutant Sample Residence Time		7.86 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.46 meters	0 meters
	Vertical	2.4 meters	0.46 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	3 meters	no obstruction
	Vertical	2.4 meters	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Thomas Rd.	Thomas Rd.

SOUTH SCOTTSDALE		
Distance and Direction to Road	66 meters, N	62 meters, N
Average Daily Traffic Count	33,000	33,000
Nearest Major Roadway B	Miller Rd.	Miller Rd.
Distance and Direction to Road	32 meters, W	35 meters, W
Average Daily Traffic Count	13,000	13,000
Groundcover	Pavement	Pavement

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

TEMPE			
County ID: TE AQS ID: 04-013-4005 Address: 1525 S College Ave., Tempe Coordinates: 33.4123 N, -111.93471 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	44201	81102	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	Not Applicable	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	26	26
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2018	5	3	3

TEMPE			
Dates of PE Audits	01/02/18 01/16/18 05/08/18 07/31/18 11/07/18	02/13/18 05/08/18 11/07/18	02/13/18 05/08/18 11/07/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	07/01/2000	03/01/2012	03/01/2012
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Note: The same monitor measures PM_{10} and $PM_{2.5}$.			
Method Code	087	208	182
PM Monitor Flow Type	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria			
Site Type	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors	Not Applicable	0 meters	0 meters
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.			

TEMPE				
Probe Height (distance above ground level to inlet)		4.4 meters	3.1 meters	3.1 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time		5.03 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.46 meters	0 meters	0 meters
	Vertical	2 meters	0.76 meters	0.76 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		Apache Blvd.	Apache Blvd.	Apache Blvd.
Distance and Direction to Road		370 meters, N	370 meters, N	370 meters, N
Average Daily Traffic Count		32,170	32,170	32,170
Groundcover		Gravel	Gravel	Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

THIRTY-THIRD		
County ID: TT AQS ID: 04-013-4020 Address: 3248 W Moreland Ave., Phoenix Coordinates: 33.46173 N, -112.12796 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**NO_2**	
Parameter Code	42602	
Parameter Occurrence Code	1	
Collection Frequency	Continuous	
Analysis Method (filter samples only)	Not Applicable	
Any Proposal to Remove or Move Monitor?	No	
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	
Are Data Comparable to Respective NAAQS?	Yes	
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	
Number of Flow Rate Verifications in 2018 (PM or Pb)	Not Applicable	
Frequency of Flow Rate Verifications		
Number of PE Audits Performed in 2018	5	
Dates of PE Audits	04/26/18 05/07/18 08/14/18	10/22/18 11/05/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	
Date of Annual Data Certification Submission	04/30/19	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	09/01/2015	
Monitor Type	SLAMS	

THIRTY-THIRD		
Monitor Make – Model		Teledyne API – 200T / Thermo 42i
Method Code		099 / 074
Method Type (FRM, FEM, ARM)		FRM
Appendix D Requirements - Network Design Criteria		
Site Type		Source-Oriented
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Micro
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		7 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		9.59 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	3 meters
	Vertical	0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Dripline of Closest Tree(s)		15.2 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		I-10
Distance and Direction to Road		13.5 meters, N
Average Daily Traffic Count		245,632
Groundcover		Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

WEST 43RD AVENUE	
County ID: WF AQS ID: 04-013-4009 Address: 3940 W Broadway Rd., Phoenix Coordinates: 33.40635 N, -112.14426 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**PM_{10}**
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	Not Applicable
Frequency of 1-Point Precision (QC) Checks	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	26
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed in 2018	5
Dates of PE Audits	02/22/18 03/08/18 06/13/18 09/06/18 12/11/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable	

WEST 43RD AVENUE		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started		04/01/2002
Monitor Type		SLAMS
Monitor Make - Model		Thermo - TEOM 1405-S
Method Code		079
PM Monitor Flow Type		Low Volume
PM Monitor Collection Type		Size Specific
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Highest Concentration
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Middle
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		5 meters
Airflow Arc		360º
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time		Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	0.6 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Dripline of Closest Tree(s)		4.5 meters
Distance to Furnace or Flue		No Furnace or Flue

WEST 43RD AVENUE	
Nearest Major Roadway A	Broadway Rd. (E of 35th Ave.)
Distance and Direction to Road	37 meters, S
Average Daily Traffic Count	12,501
Nearest Major Roadway B	35th Ave. (N. of Broadway Rd.)
Distance and Direction to Road	1 kilometer, E
Average Daily Traffic Count	19,699
Groundcover	Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

WEST CHANDLER			
County ID: WC AQS ID: 04-013-4004 Address: 275 S Ellis, Chandler Coordinates: 33.29896 N, -111.88426 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**CO**	**O_3**	**PM_{10}**
Parameter Code	42101	44201	81102
Parameter Occurrence Code	1	1	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	26	Not Applicable
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	Not Applicable	26
Frequency of Flow Rate Verifications			Bi-Weekly
Number of PE Audits Performed in 2018	5	5	4
Dates of PE Audits	03/14/18 04/11/18 09/12/18 10/10/18 12/19/18	01/19/18 04/25/18 07/06/18 10/10/18 12/19/18	03/14/18 06/06/18 09/12/18 12/05/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19

WEST CHANDLER				
Appendix B Requirements - PSD Monitoring - Not Applicable				
Appendix C Requirements - Monitoring Methodology				
Date Sampling Started		07/01/2000	07/01/2000	07/01/2000
Monitor Type		SLAMS	SLAMS	SLAMS
Monitor Make - Model		Teledyne API – 300T	Teledyne API – 400T	Thermo – TEOM 1405-S
Method Code		093	087	079
PM Monitor Flow Type		Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type		Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FRM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		FEP	FEP	Not Applicable
Pollutant Sample Residence Time		4.52 seconds	4.52 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction

WEST CHANDLER				
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	14 meters	14 meters	14 meters
	Vertical	3 meters	3 meters	3 meters
Distance from Dripline of Closest Tree(s)		14 meters	14 meters	14 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Frye Rd.	Frye Rd.	Frye Rd.
Distance and Direction to Road		30 meters, S	30 meters, S	30 meters, S
Average Daily Traffic Count		10,566	10,566	10,566
Groundcover		Pavement / Gravel	Pavement / Gravel	Pavement / Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

WEST PHOENIX						
County ID: WP AQS ID: 04-013-0019 Address: 3847 W Earll, Phoenix Coordinates: 33.48378 N, -112.14256 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa						
General Information						
Pollutant	**CO**	**NO_2**	**O_3**	**PM_{10}**	**$PM_{2.5}$ Primary**	**$PM_{2.5}$ Secondary**
Note: This is a collocated site for $PM_{2.5}$.						
Parameter Code	42101	42602	44201	81102	88101	88101
Parameter Occurrence Code	1	1	1	1	3	2
Collection Frequency	Continuous	Continuous	Continuous	Continuous	Continuous	1 in 12 days
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	*As per 40 CFR Part 50, Appendix L*
Analytical Laboratory (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Inter-Mountain Labs, Inc.
Any Proposal to Remove or Move Monitor?	No	No	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs						
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	26	26	26	Not Applicable	Not Applicable	Not Applicable

WEST PHOENIX						
Frequency of 1-Point Precision (QC) Checks	Bi-Weekly	Bi-Weekly	Bi-Weekly			
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	Not Applicable	Not Applicable	Not Applicable	26	26	12
Frequency of Flow Rate Verifications				Bi-Weekly	Bi-Weekly	Bi-weekly
Number of Required Collocated Assessments in 2018 ($PM_{2.5}$ Only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	30	
Number of Valid Collocation Assessments in 2018 ($PM_{2.5}$ Only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	41	
Number of Collocation Assessments in 2018 ($PM_{2.5}$ Only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	55	
Number of PE Audits Performed in 2018	3	6	6	4	4	4
Dates of PE Audits	02/20/18 06/12/18 07/24/18	01/23/18 02/06/18 06/12/18 07/10/18 09/04/18 12/26/18	01/09/18 02/20/18 06/12/18 07/10/18 08/07/18 09/18/18	03/06/18 06/12/18 09/04/18 12/11/18	03/06/18 06/12/18 09/04/18 12/11/18	01/09/18 04/03/18 07/03/18 10/03/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/19	04/30/19	04/30/19	04/30/19	04/30/19	04/30/19
Appendix B Requirements - PSD Monitoring - Not Applicable						

WEST PHOENIX						
Appendix C Requirements - Monitoring Methodology						
Date Sampling Started	01/01/1984	05/24/1990	01/01/1984	02/01/1988	09/01/2005	06/13/2000
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne - API 300T	Teledyne - API 200T	Teledyne - API 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF	Thermo - Partisol 2025
Notes: The same monitor collects PM_{10} and $PM_{2.5}$ hourly (continuous) measurements. The collocated Partisol 2025 sampler collects a QA filter sample once every 12 days.						
Method Code	093	099	087	208	182	145
PM Monitor Flow Type	Not Applicable	Not Applicable	Not Applicable	Low Volume	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Not Applicable	Dichotomous	Dichotomous	Size Specific & Sequential
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM	FEM	FEM	FRM
Appendix D Requirements - Network Design Criteria						
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Highest Concentration	Highest Concentration
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria						
Distance between collocated $PM_{2.5}$ monitors	Not Applicable	Not Applicable	Not Applicable	2 meters	2 meters	2 meters

WEST PHOENIX							
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	Not Applicable	Not Applicable	0 meters	0 meters	2 meters
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.							
Probe Height (distance above ground level to inlet)		4.3 meters	4.3 meters	4.3 meters	5 meters	5 meters	4 meters
Airflow Arc		360º	360º	360º	360º	360º	360º
Probe Sample Line Material		FEP	FEP	FEP	Not Applicable	Not Applicable	FEP
Pollutant Sample Residence Time		5.98 seconds	5.98 seconds	5.98 seconds	Not Applicable	Not Applicable	Not Applicable
Filter Sample Material		Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	FEP
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters	0.6 meters	0.6 meters	0.5 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction

WEST PHOENIX							
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree	no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.
Distance and Direction to Road		360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S
Average Daily Traffic Count		29,000	29,000	29,000	29,000	29,000	29,000
Groundcover		Gravel	Gravel	Gravel	Gravel	Gravel	Gravel

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

ZUNI HILLS		
County ID: ZH AQS ID: 04-013-4016 Address: 10851 W Williams Rd., Sun City Coordinates: 33.68719 N, -112.29416 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**PM_{10}**	
Parameter Code	81102	
Parameter Occurrence Code	1	
Collection Frequency	Continuous	
Analysis Method (filter samples only)	Not Applicable	
Any Proposal to Remove or Move Monitor?	No	
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable	
Are Data Comparable to Respective NAAQS?	Yes	
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point Precision (QC) Checks Performed in 2018 (Gases)	Not Applicable	
Frequency of 1-Point Precision (QC) Checks		
Number of Flow Rate Verifications Performed in 2018 (PM or Pb)	26	
Frequency of Flow Rate Verifications	Bi-Weekly	
Number of PE Audits Performed in 2018	4	
Dates of PE Audits	03/01/18 06/07/18	09/13/18 12/17/18
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	
Date of Annual Data Certification Submission	04/30/19	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	12/01/2009	
Monitor Type	SLAMS	
Monitor Make - Model	Thermo - TEOM 1405-S	

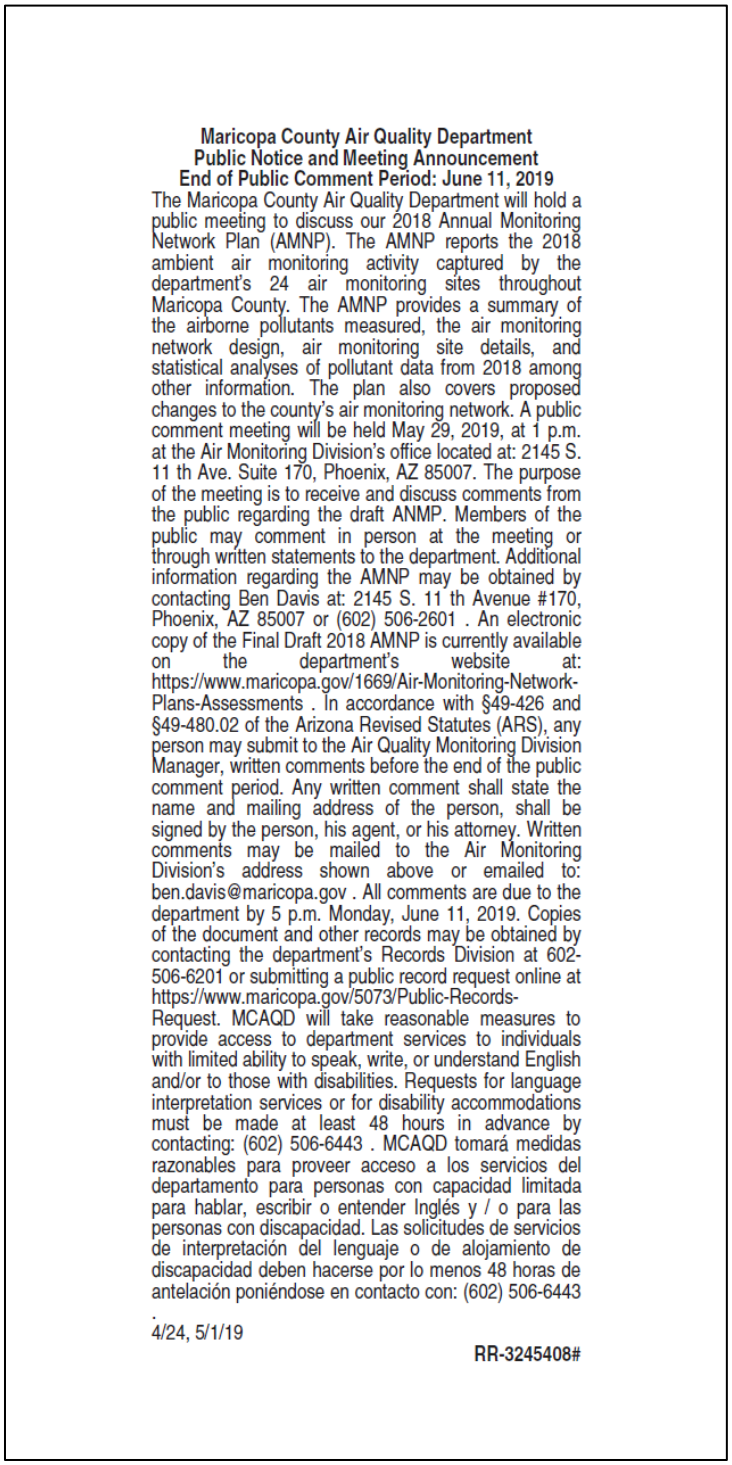
ZUNI HILLS		
Method Code		079
PM Monitor Flow Type		Low Volume
PM Monitor Collection Type		Size Specific
Method Type (FRM, FEM, ARM)		FEM
Appendix D Requirements - Network Design Criteria		
Site Type		Population Exposure
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		3.3 meters
Airflow Arc		360º
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time		Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	1 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions
	Vertical	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	6 meters
	Vertical	3 meters
Distance from Dripline of Closest Tree(s)		9 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		Williams Rd.
Distance and Direction to Road		200 meters, N
Average Daily Traffic Count		2,567
Groundcover		Lawn / Soil

Sources: For QC checks and FR verifications and collocation assessments - EPA AQS database - *2018 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2018 QA Raw Assessment Report (AMP251)*

APPENDIX III – 2018 PUBLIC NOTICE AND COMMENT INFORMATION

Public Notice Announcement

Figure 18 shows the public announcement advertisement as it appeared when published.



Maricopa County Air Quality Department
Public Notice and Meeting Announcement
End of Public Comment Period: June 11, 2019

The Maricopa County Air Quality Department will hold a public meeting to discuss our 2018 Annual Monitoring Network Plan (AMNP). The AMNP reports the 2018 ambient air monitoring activity captured by the department's 24 air monitoring sites throughout Maricopa County. The AMNP provides a summary of the airborne pollutants measured, the air monitoring network design, air monitoring site details, and statistical analyses of pollutant data from 2018 among other information. The plan also covers proposed changes to the county's air monitoring network. A public comment meeting will be held May 29, 2019, at 1 p.m. at the Air Monitoring Division's office located at: 2145 S. 11 th Ave. Suite 170, Phoenix, AZ 85007. The purpose of the meeting is to receive and discuss comments from the public regarding the draft ANMP. Members of the public may comment in person at the meeting or through written statements to the department. Additional information regarding the AMNP may be obtained by contacting Ben Davis at: 2145 S. 11 th Avenue #170, Phoenix, AZ 85007 or (602) 506-2601 . An electronic copy of the Final Draft 2018 AMNP is currently available on the department's website at: https://www.maricopa.gov/1669/Air-Monitoring-Network-Plans-Assessments . In accordance with §49-426 and §49-480.02 of the Arizona Revised Statutes (ARS), any person may submit to the Air Quality Monitoring Division Manager, written comments before the end of the public comment period. Any written comment shall state the name and mailing address of the person, shall be signed by the person, his agent, or his attorney. Written comments may be mailed to the Air Monitoring Division's address shown above or emailed to: ben.davis@maricopa.gov . All comments are due to the department by 5 p.m. Monday, June 11, 2019. Copies of the document and other records may be obtained by contacting the department's Records Division at 602-506-6201 or submitting a public record request online at https://www.maricopa.gov/5073/Public-Records-Request. MCAQD will take reasonable measures to provide access to department services to individuals with limited ability to speak, write, or understand English and/or to those with disabilities. Requests for language interpretation services or for disability accommodations must be made at least 48 hours in advance by contacting: (602) 506-6443 . MCAQD tomará medidas razonables para proveer acceso a los servicios del departamento para personas con capacidad limitada para hablar, escribir o entender Inglés y / o para las personas con discapacidad. Las solicitudes de servicios de interpretación del lenguaje o de alojamiento de discapacidad deben hacerse por lo menos 48 horas de antelación poniéndose en contacto con: (602) 506-6443 .

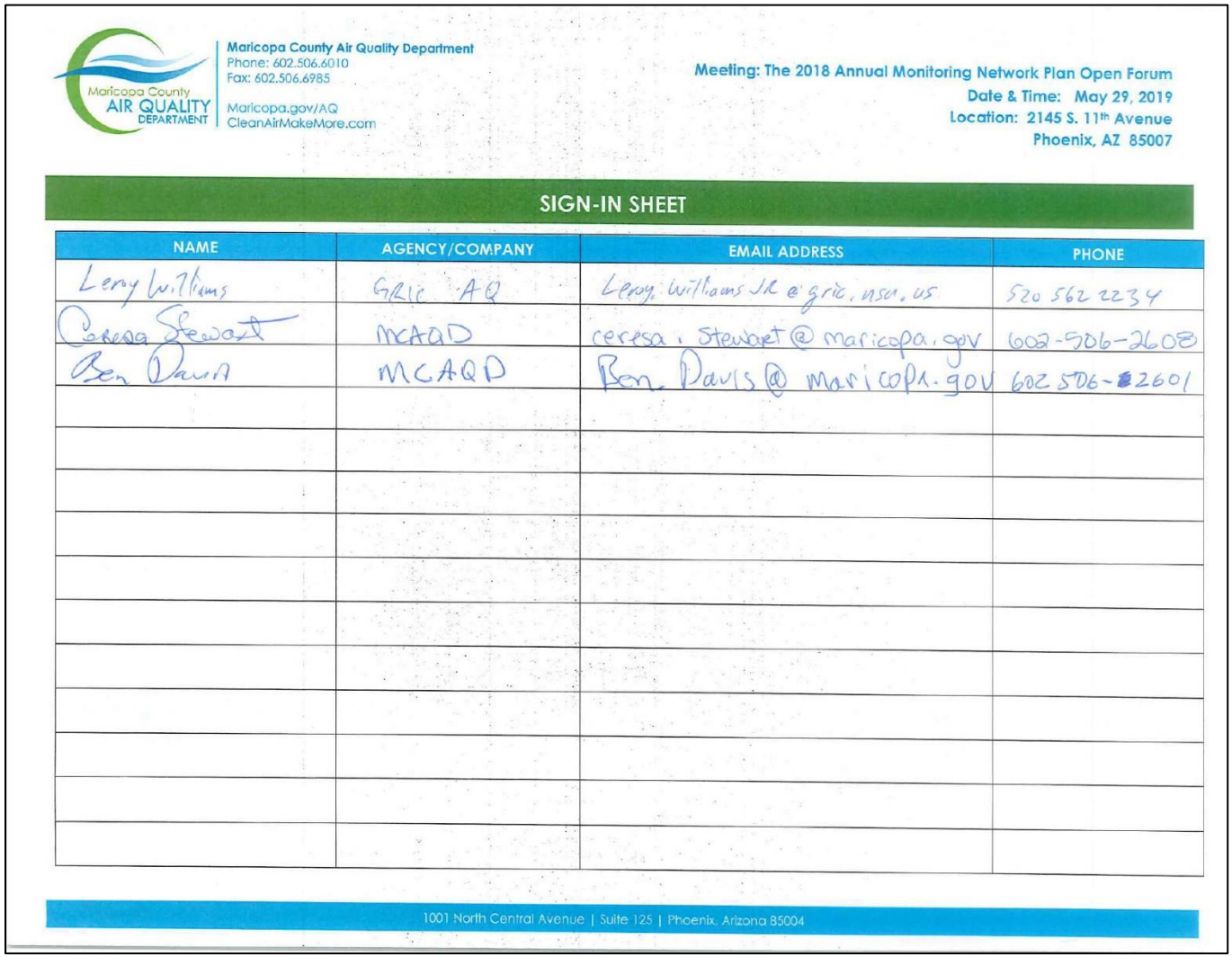
4/24, 5/1/19

RR-3245408#

Figure 18. 2018 Public Announcement

Public Meeting Attendance

Figure 19 shows the 2018 AMNP public meeting attendance.



Maricopa County Air Quality Department
Phone: 602.506.6010
Fax: 602.506.6985
Maricopa.gov/AQ
CleanAirMakeMore.com

Meeting: The 2018 Annual Monitoring Network Plan Open Forum
Date & Time: May 29, 2019
Location: 2145 S. 11th Avenue
Phoenix, AZ 85007

SIGN-IN SHEET

NAME	AGENCY/COMPANY	EMAIL ADDRESS	PHONE
Leroy Williams	GRIC AQ	Leroy.Williams.Jr@gric.nsn.us	520 562 2234
Ceresa Stewart	MCAQD	ceresa.stewart@maricopa.gov	602-506-2608
Ben Davis	MCAQD	Ben.Davis@maricopa.gov	602 506-2601

1001 North Central Avenue | Suite 125 | Phoenix, Arizona 85004

Figure 19. Public Meeting Sign-In Sheet

Public Comments Received

None received

Maricopa County's Responses to Public Comments

None made

Additional Comments Received

None received

Maricopa County's Responses to Additional Comments

None made

APPENDIX IV - GLOSSARY

Glossary of Acronyms and Terms

98th percentile	The 98th percentile is defined in *40 CFR Part 50 Appendix N* as "the smallest daily value out of a year of $PM_{2.5}$ mass monitoring data below which no more than 98 percent of all daily values fall using the ranking and selection method specified in section 4.5(a) of this appendix".
ADEQ:	Arizona Department of Environmental Quality
ADT:	Average Daily Traffic count
aka:	Also known as
AMD:	Air Monitoring Division
AMNP or ANP:	Air Monitoring Network Plan - an annual report produced for U.S. EPA each calendar year that provides comprehensive information regarding the performance of the County's air quality surveillance system, e.g., network of SLAMS and SPM monitoring stations and / or sites, and the data collected and reported to EPA. The plan includes proposed future changes to the system as well.
Analysis Method	Refers to the laboratory method used to process and analyze PM and Pb filter samples.
Analyzer:	A monitor that samples the air and produces near real-time data without collecting a sample that must be laboratory analyzed.
ANSI:	American National Standards Institute
AQI:	Air Quality Index - the index that applies to each criteria pollutant and shows the concentration of each pollutant relative to its respective standard. When the AQI reaches 101, the pollutant's concentration has exceeded the NAAQS.
AQS:	Air Quality System, sometimes defined as the Air Quality Subsystem. The AQS is the U.S. EPA's ambient air database.
ASQ:	American Society for Quality
Attainment:	Attainment refers to a geographical area as being "in compliance" with a NAAQS and the U.S. Clean Air Act. After several years of no violations of a NAAQS, the U.S. EPA can classify a geographic area as in attainment for a particular CP.
AWT:	Average Weekday Traffic count
BAM:	Beta Attenuation Monitor. A continuous particulate measuring instrument used previously by MCAQD to measure PM_{10}.
CAA:	Clean Air Act
CASAC:	Clean Air Scientific Advisory Committee
CBSA:	Core-Based Statistical Area – is defined by the U.S. Office of Management and Budget as a statistical geographic entity consisting of the county or counties associated with at least one urbanized area/urban

	cluster of at least 10,000 in population, plus adjacent counties having a high degree of social and economic integration.
CFR:	The *Code of Federal Regulations* is published annually and contains the codification of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the Federal Government. An *eCFR* is a free electronic version; however, it is not the legal version.
Class I Area:	Federally designated areas of special national or regional scenic, recreational, or historic value where maximum protection of environmental quality is highest. Class 1 areas are subject to special protection including mandated visibility requirements to prevent significant deterioration.
CP:	Criteria Pollutant, or the Central Phoenix site, depending upon context
CO:	Carbon monoxide, a criteria pollutant
Collocated:	The practice of establishing a second pollutant monitor within a specified distance and of a specified type at a monitoring site for quality assurance purposes.
Continuous Monitor:	A method of monitoring air pollutants that is continually measuring the quantity of the pollutant, either gaseous or particulate. Continuous monitors are analyzers that can obtain real-time or short-term averages of pollutants. Continuous monitors may also be referred to as "automated" monitors.
Criteria Pollutants:	Six pollutants (CO, O_3, NO_2, Pb, PM, and SO_2) that have NAAQS established by the U.S. EPA.
CSA:	Combined Statistical Area - is defined by the U.S. Office of Management and Budget as when very large cities combine two or more CBSAs, these larger areas are referred to as combined statistical areas
CSN:	The chemical speciation network - a nationwide, research air monitoring network designed to ferret-out the chemical constitutes of and to discern trends in $PM_{2.5}$ pollution. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
Delta T:	The difference between two levels of temperature measurements - Delta T is measured in the MCAQD network at heights of 2 and 10 meters. A higher temperature at the upper level indicates a temperature inversion.
Design Value:	A design value is a statistic that describes the air quality status of a given area relative to the level of the NAAQS. For a concentration-based standard, the air quality design value is simply the standard-related test statistic. The design value of a pollutant monitoring network is the highest sample value in the network used to compare to the NAAQS; i.e., the 24-hour $PM_{2.5}$ design value for the network is the monitor with the highest 3-year average of the 98^{th} percentile.

Distance from Obstructions Not on Roof:	Means the horizontal distance and vertical height in meters from obstructions such as trees, walls, etc. that are higher than the sample probe/inlet.
Distance from Obstructions on Roof:	Means the horizontal distance and vertical height in meters from obstructions on a roof such as a parapets, penthouses, and firewalls to the sample probe/inlet.
Distance from Supporting Structure:	Means the horizontal distance and vertical height in meters from a building or shelter roof to the sample probe/inlet. A roof supports all monitors; whether it be the roof of a building, trailer (room/shelter), or monitor housing cabinet.
EBAM:	E-Beta Attenuation Monitor - is a rugged, portable, battery or solar-operated analyzer that is suitable for obtaining and reporting continuous measurements of particulate matter in remote locations. EBAMs are often equipped with wind speed and direction instrumentation as well. EBAMs are particularly useful for temporary measurements of PM related to an event.
EPA R9:	Environmental Protection Agency Region 9
EE:	Exceptional Event – a high CP pollution event that is considered to be uncontrollable and caused by natural sources of pollution or an event that is not expected to recur at a given location. An EE can apply to any CP, but in Maricopa County, most recent EEs have been related to high PM_{10} events.
Event:	Generally refers to a high pollution day where a NAAQS was exceeded.
Exceedance:	Generally refers to a high pollution day where a NAAQS was exceeded.
FDMS-TEOM:	Filter Dynamics Measurement System-Tapered Element Oscillating Microbalance - a continuous particulate analyzer used by MCAQD to measure $PM_{2.5}$.
FEM:	Federal Equivalent Method - an EPA-approved method of sampling and analyzing the ambient air for an air pollutant, i.e., includes the monitor and its operating firmware and procedure(s). An FEM must pass required testing found in *40 CFR Part 53* and show CP data produced are similar to the Federal Reference Method (FRM). Continuous particulate matter and some gaseous analyzers are FEMs.
Filter-based sampler:	A method of monitoring particulate pollution that involves exposing a pre-weighed filter to a specific flow rate for a prescribed period of time, usually midnight to midnight, or 1440 minutes. The filters are then post-weighed to determine the mass of particulates per volume, e.g., $\mu g/m^3$. Filter samples are stored for a period and can be referenced later if needed.
FRM:	Federal Reference Method - an EPA-approved method of sampling and/or analyzing the ambient air for an air pollutant, i.e., includes the monitor and its operating firmware and procedure(s). An FRM must pass required testing found in *40 CFR Part 53* and show CP data

	produced are accurate based on acceptable precision and bias limits. These methods are the baseline that all other methods reference, e.g., Federal Equivalency Methods (FEM).
HAPs:	Hazardous Air Pollutants - airborne chemicals that are been listed in the federal Clean Air Act and have an associated standard or process requirement determined for it.
Sample Probe/Inlet Height:	Means the vertical height in meters *above the roof*, or additional supporting structure on top of the roof if present, to the air sample intake. In general, gas samples enter through a probe at the end of the sample line and PM and Pb samples enter through an inlet that helps control the aerodynamic size of particles sampled.
MAG:	Maricopa Association of Governments
MCAQCED:	Maricopa County Air Quality Compliance and Enforcement Division
MCAQD:	Maricopa County Air Quality Department
Metadata:	refers to data (information) that provide information about other data
MO:	Monitoring organization
Monitor:	Monitor is a term that refers to an instrument, sampler, analyzer, or other device that measures or assists in the measurement of atmospheric air pollutants and which is acceptable for use in ambient air surveillance under the applicable provisions of *40 CFR Part 58 Appendix C*.
µg/m^3:	micrograms per cubic meter
µm:	micrometers
MSA:	Metropolitan Statistical Area is designated by the U.S. Office of Management and Budget as a geographical area based on the concept of a core area with a large population nucleus, plus adjacent communities having a high degree of economic and social integration within that core. Metropolitan and micropolitan statistical areas are the two categories of CBSAs. Metropolitan areas have populations greater than 50,000, and micropolitan areas have populations between 10,000 and 50,000. The AMD operates air monitoring stations within the Phoenix-Mesa MSA, which includes portions of Maricopa and Pinal County.
NAAQS:	National Ambient Air Quality Standards - health and welfare-based standards established by the U.S. EPA that set permissible airborne concentration levels for the CPs.
NATTS:	National Air Toxics Trend Stations - a nationwide, research air monitoring program designed to measure toxic air pollutant trends. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
NCore:	National Core multi-pollutant is a national network of multi-pollutant monitoring sites used to represent the nation as a whole. There are currently ~75 NCore sites, 1 to 3 per state plus Washington D.C., Virgin

	Islands, and Puerto Rico located in both urban and rural areas. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
Network:	All stations of a given type or types
NO_2:	Nitrogen dioxide. The indicator compound used to gauge the ambient concentration of NO_x.
NO_X:	Nitrogen oxide(s), a criteria pollutant. NO_x is the sum of nitric oxide (NO), NO_2, and other nitrogen-containing compounds.
Nonattainment:	Means a geographical area is "not in compliance" with the NAAQS and the U.S. Clean Air Act. After several years of violating a NAAQS, the EPA can classify a geographic area as being in nonattainment for a particular criteria pollutant.
O_3:	Ozone, a criteria pollutant
OAQPS:	The U.S. EPA Office of Air Quality Planning and Standards, located in Research Triangle Park, N.C., which serves as EPA "Headquarters" for ambient air monitoring guidance and the NAAQS reviews.
PAMS:	Photochemical Ambient Monitoring Stations - a nationwide, research air monitoring program designed to measure specific airborne chemicals that are known to be "precursor pollutants" that form ozone when combined with ultraviolet light and heat. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
PCAQCD:	Pinal County Air Quality Control District
Pb:	Lead, a criteria pollutant
Performance Evaluation (PE) Audit:	Refers to the AMD QA section's audits on pollutant monitors. • For gaseous analyzers, the EPA requires that an Annual Performance Evaluation be performed on each analyzer at least once annually, e.g., as per *40 CFR Part 58, Appendix A, §3.2.2.*, 25 percent of the monitors operating within each gaseous pollutant's network are evaluated quarterly; thereby, each monitor is evaluated once per year. • For PM and Pb monitors, e.g., analyzers and samplers, EPA requires that a Semi-Annual Flow Rate Audit be performed on each monitor at least twice annually, e.g., as per *40 CFR Part 58, Appendix A, §§3.2.4 and 3.3.4*, and *40 CFR Part 58, Appendix A, §3.4,* respectively.
PM:	Particulate matter, also known as "particulates", project manager, or preventative maintenance depending on context
$PM_{2.5}$:	Particulate matter 2.5 micrometers in aerometric diameter or smaller, a criteria pollutant. $PM_{2.5}$ is also referred to as "fine" particulate matter.
PM_{10}:	Particulate matter 10 micrometers in aerometric diameter or smaller, a criteria pollutant

$PM_{10-2.5}$ and / or PM_c:	"Coarse" particulate matter is less than 10 micrometers, but recently, has come to mean PM_{10} minus $PM_{2.5}$, not currently regulated as a lone criteria pollutant.
ppb:	parts per billion
ppm:	parts per million
PQAO:	Primary quality assurance organization - a monitoring organization (MO) or other organization that is responsible for a set of air monitoring stations that monitor the same pollutant and for which data quality assessments can be pooled. Each criteria pollutant sampler/monitor at a monitoring station in the SLAMS and SPM networks must be associated with one, and only one, primary quality assurance organization.
Primary Standard:	The portion of the NAAQS designed to protect public health.
Probe:	The end of a sample line where a gas sample is extracted from the atmosphere for delivery to a point analyzer for pollutant analysis
Probe/Inlet Height:	The vertical height in meters *above ground level* to the air sample intake location for an analyzer or sampler
Probe (Sample) Line Material:	Refers to the chemical composition of the sample line tubbing.
QA:	Quality assurance – generally refers to the administrative or managerial processes in place to verify that quality control activities are successfully carried out by personnel and that data produced meet specified quality requirements prior to use, i.e., written guidance documents, program oversight activities, etc.
QC:	Quality control – generally refers to the technical activities in place to produce high quality data, i.e., air monitoring instruments operate within specified criteria, data collection from sites, etc.
Quality System:	The overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer. (see *ANSI/ASQ E4-2004)*
RRNS:	Rapid Response Notification System - a communication tool used by MCAQD to manage high pollution events by alerting residents, intergovernmental personnel, and stakeholders of increasing PM concentrations.
Sampler:	A type of air monitor that collects a physical sample for analysis. Air samples may be collected onto a filter, cartridge, or other medium, or into a device such as a canister.
Sample Residence Time:	This measurement applies to CO, NO_2, O_3, and SO_2 sample lines and it mean the amount of time in seconds that it takes for a sample of air to travel from the probe intake to the bulkhead of the point analyzer. EPA

	recommends a residence time of 10 seconds, but 20 second is the maximum allowable.
Secondary Standard:	The portion of the NAAQS designed to protect public welfare and the environment.
SIP:	State Implementation Plan - a SIP is a plan produced by state and/or local regulatory agencies that specifies obligations that will be taken for a geographic area in nonattainment to meet the NAAQS for a criteria pollutant. SIPs are also developed for maintaining compliance with the NAAQS.
Site:	A site is a geographic location. One or more air monitoring stations can be located at a site.
SLAMS:	State and Local Air Monitoring Station - the SLAMS network consists of approximately 5,000 monitoring stations nationwide whose size and distribution is largely determined by the needs of State and local air pollution control agencies to meet their respective SIP requirements. Other types of monitoring stations include: NCore (national core) and SPM (special purpose). Currently, the AMD operates SLAMS only.
SO_2:	Sulfur dioxide, a criteria pollutant
SPM:	Special Purpose Monitor - a special purpose monitor provides data for special studies needed by the State and local agencies to support SIPs and other air program activities. The SPMs are not permanently established as part of a particular pollutant's monitoring station(s); their location can be adjusted easily to accommodate changing needs and priorities.
SSI:	Size Selective Inlet - the inlet used on high- and low-volume particulate samplers and analyzers to determine the size of particles sampled or measured by the monitor. The particle size separation process usually employs impaction, filtration, or cyclonic flow.
Station:	A station may comprise a single CP monitor, or a group of monitors with a shared objective, located at a particular site.
TEOM:	Tapered Element Oscillating Microbalance - an automated, continuous FEM PM analyzer used by MCAQD to measure PM_{10} and/or $PM_{2.5}$ concentrations, depending upon the instrument model and air sample inlet configuration(s).
tpy:	tons per year
UATMP:	Urban Air Toxics Monitoring Program - a nationwide research air monitoring program designed to measure toxic air pollutants within urban areas. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
U.S. EPA:	United States Environmental Protection Agency

VOC: Volatile Organic Compound - VOCs are chemical compounds that can easily vaporize and enter the atmosphere. There are many natural and artificial sources of VOCs; solvents and gasoline make up some of the largest artificial sources. VOCs will react with NO_x in the presence of sunlight to create ground-level O_3 pollution.

Volume:

a. The amount of air sampled for analysis. Volume is calculated by multiplying a monitor's flowrate by the collection time, usually in minutes.

Volume = flowrate X minutes

b. The amount of data in a file or database.